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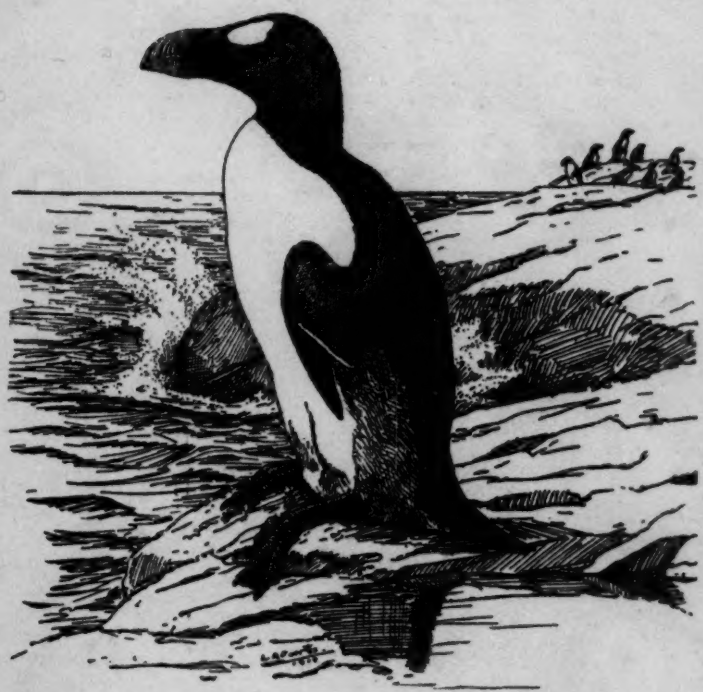

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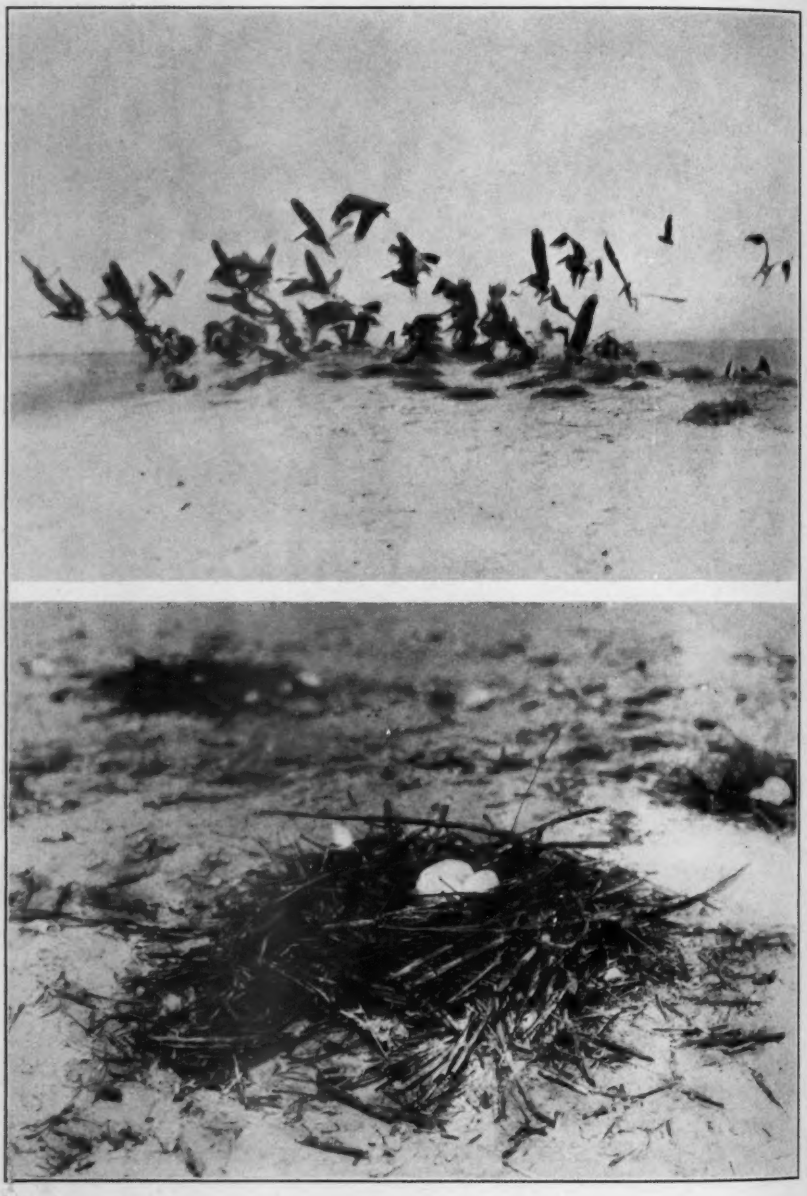


Photos by LeRoy Halsey.

BROWN PELICANS AND NESTS ON BIRD BANK, BULL'S BAY, S. C.

THE AUK:

A QUARTERLY JOURNAL OF

ORNITHOLOGY.

VOL. XLII. JULY, 1925. No. 3.

AN AVIAN CITY OF THE SOUTH CAROLINA COAST.

BY ALEXANDER SPRUNT, JR.

Plates XII–XV.

THE coast line of South Carolina is admirably adapted to the wants of the various species of sea birds which visit, and breed, on the out-lying sand bars and banks of our southern shore line. To travelers who have made the trip from northern points to Florida waters by boat, this region will be remembered as a part of the inland water-way, which runs along the Atlantic seaboard, from New York to Miami. The coast line of South Carolina is bordered by a chain of long, narrow islands, broken by inlets and bays, with vast stretches of salt marsh between them and the mainland. These islands are, for the most part, uninhabited, and are grown up in thick forests of pine and oak, interspersed with thickets of cassina and myrtle bushes.

The moss-hung oaks, the dense thickets of palmetto and "Spanish bayonet," which, at times, assume jungle-like proportions, remind one strongly of the tropics. Wild life abounds on these isolated islands, especially the larger ones such as Bull's, Kiawah, and St. Helena, affording a paradise for the sportsman, as deer and Wild Turkeys are common. Bull's Island is noted for the numbers of deer found there with albinistic tendency, and specimens have been taken in which this abnormal condition is total, there being at least one specimen in the American Museum of Natural History, which beautifully illustrates this phenomenon.

Interesting as these islands are, it is the smaller banks and keys

off shore which afford the bird lover rare treats of ornithological delight. For ages past they have been the haunt of the sea birds, and it is gratifying to note that, even with the fast disappearing colonies of so many of these birds in other places, this region is still blessed with its sea bird visitors, and with the strict enforcement of the admirable Federal Migratory Bird Act, these interesting spots can be preserved for years to come.

A trip to one of these breeding colonies is a journey long to be remembered, and well worth anyone's while. Being in museum work, it has been my privilege to visit, from time to time, one or two of these colonies in the vicinity of Charleston, and each visit is always more of a delight than the last. The trip is usually made to banks which lie in Bull's Bay, about fifty miles to the north of Charleston and just south of Cape Romain. The bay is a wide, shallow sheet of water, lying between Cape Romain on the north and Bull's Island on the south. In shape, it is a crescent, the two horns reaching out toward the open sea, and the inner curve bounded by the mainland, with a fringe of marsh extending out for some little distance into the bay. There are winding creeks through the marsh which form a part of the above mentioned inland water-route, which lies, for the most part, behind the chain of islands, which form a natural barrier between it and the ocean, thus making it possible for small craft to make the long journey from New York to Florida.

Leaving Charleston one bright June morning, we crossed the harbor, and entered the water-way between Sullivan's Island and the mainland. This island is a great summer resort for the people of Charleston, and is thickly populated during this season. After running behind it for about five miles, we come to the inlet which divides it from Long Island or the Isle of Palms, the next in the chain. This "link" in nature's great cable is about thirteen miles long and nowhere over a mile wide. As the launch winds its sinuous way along through the marshes, the abundant bird life of the region makes itself known in every direction.

Multitudes of Red-winged Blackbirds flute their musical calls from the myrtle thickets, the bubbling tinkle of the Worthington's Marsh Wren issues from the marshes on all sides, Boat-tailed Grackles wing their way from the mud flats to the bulky nests

among the reeds, and, from the wooded fringe of Long Island comes the note of the Nonpareil, while the soft coo-oo-o of the Mourning Dove echoes from the pines.

A straggling Laughing Gull in all the glory of its pearl gray mantle and slaty hood, floats over us on graceful wing; to and from the vast stretches of the flats, whirl the migrating flocks of shore birds, their white underparts flashing in the sunlight as they wheel and turn like cavalry at drill. There, on a bank of raccoon oysters, stand a pair of American Oyster-catchers, the contrasting black and white coloration standing out against the drab background of mud and ooze. While yet a goodly distance from them, they take wing, whirl off with mellow whistles and alight on a bank half a mile further up the creek.

The shrill call of the Willet is a common sound as these large waders pass over, inquiring in no uncertain terms as to why their domain is being invaded. Herons take wing from the marsh close at hand, both the Louisiana and Little Blue being seen in numbers, and we may even be privileged to see that lovely vision in snow white nuptial dress, the Snowy Egret. There is one now, daintily picking its way across the mud, lifting its yellow feet high, as if disdaining the lowly character of the feeding ground.

As we round a sharp turn in the creek, a magnificent Great Blue Heron springs from the marsh and flaps away with strong wing beats, its long legs trailing behind, while a glance upward discloses a majestic Bald Eagle, soaring in huge circles and waiting for some wandering Osprey to furnish him with a dinner.

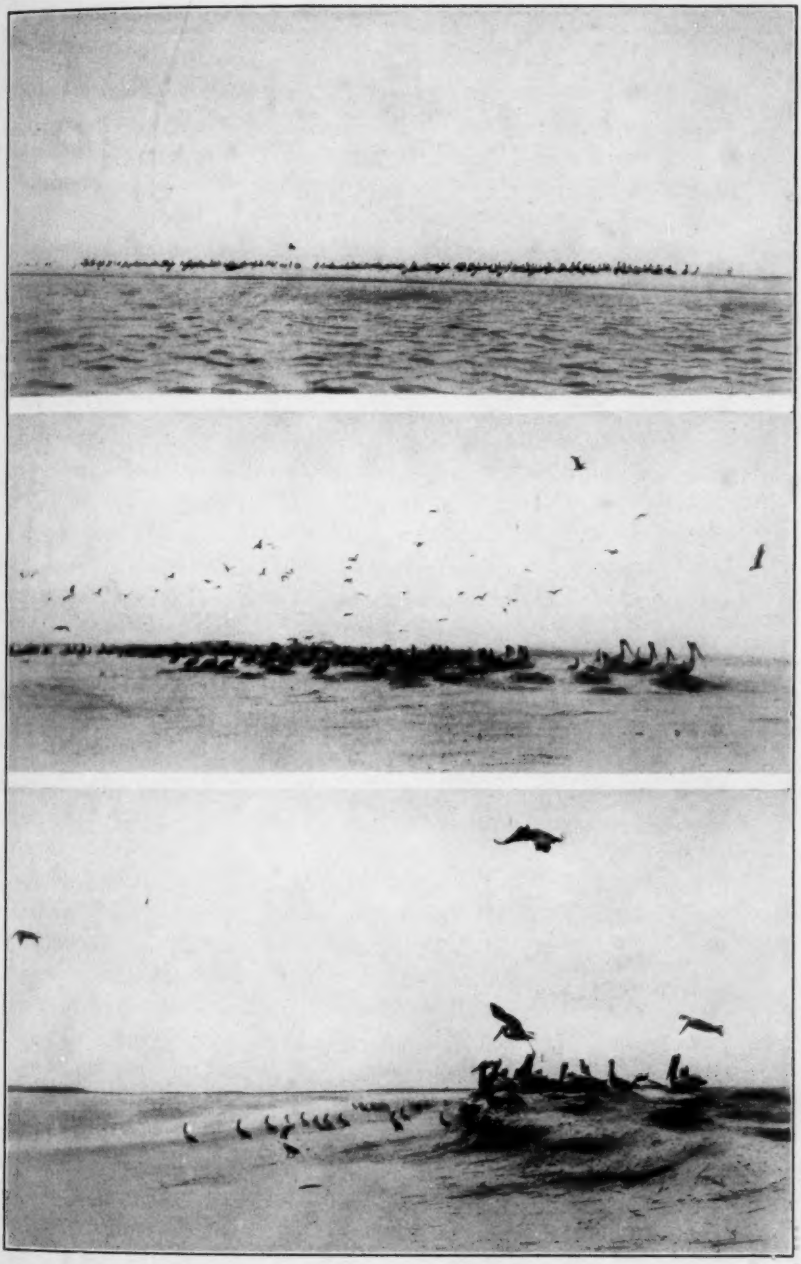
And so on we go along this wonderful water trail, leaving Long, Capers and Bull's Islands behind until we finally round the north end of the last and Bull's Bay lies spread out before us. It is a beautiful sheet of water, but at most times, a dangerous one. Being very shallow, except in the channel, and fronting directly on the ocean, it is wide open to the sweep of the wind, and woe to the small boat caught far out upon its surface when the wind rises, and the swells lift themselves over the low lying sand bars. Only a pilot who knows the winding channel, and is, in a measure, familiar with the shifts of the wind and general look of the weather, should be trusted to take a launch out to the

bird cities on Bird Bank and Vessel Reef, which appear as low dark lines far out in the bay.

The day in question was a beautiful one. A gentle breeze ruffled the surface of the bay into tiny wavelets, the turquoise dome of the sky, flecked with fleecy clouds, arched overhead while the bright sunlight glinted over the ruffled surface with beautiful effect. As we neared Bird Bank, the outlines of the denizens of the city became apparent, (see picture of the Pelicans on the beach). Anchoring the launch about fifty yards from the shore, we got into a skiff and rowed ashore. As we landed on the smooth sands, a wonderful sight greeted us. Fifty to one hundred yards away, were multitudes of those master fishermen of the sea, the Brown Pelicans. There they sat upon their nests, score upon score of them, their long bills resting against their breasts, and eyeing the approaching invaders with solemn curiosity. Off to one side the sand looked as if it was covered with a huge snowy blanket, flecked in all directions with small dark spots. As we neared this strange looking locality, the "blanket" suddenly erupted into the air, with harsh screams, squawks and cries, and, whirling above us, dipping and darting with amazingly complicated gyrations, were hundreds of the beautiful Royal Terns.

There is something in the wild freedom of these magnificent birds that strikes a responsive chord in the breast of every lover of nature. Standing in the midst of the colony, with the natural setting of ocean, sand and sky, at times almost obscured by the cloud of screaming birds, the ground dotted with the eggs and the roar of the surf mingling with the voices of the disturbed and angry terns, one's feelings cannot be described. The clamour is almost deafening as we pick our way between the hundreds of eggs, each lying in its little hollow in the sand, while every now and then, one of the frantic birds swoops with arrow-like swiftness down almost on our heads, as if to offer fight to these monsters who have invaded its home.

Flocks of Black Skimmers rise from the sand, and wing across our front on long narrow pinons, sweeping and whirling in wide circles, all thewhile uttering their peculiar barking notes. Coming up to the Pelican city, these great birds rise with a roar of wings to float out over the surf, or to alight further up the beach and stand in dignified groups, and solemnly await our departure.



Photos by LeRoy Halsey.

THE BROWN PELICAN COLONY, BIRD BANK, BULL'S BAY, S. C.

The Brown Pelican is a common breeder on the South Carolina coast, but is very erratic in regard to choosing any one locality as a breeding ground. One year they may be on Bird Bank in large numbers, while the next they may remove to Raccoon Key, further up the coast, and again they may not use either of these places, but pick out a bank many miles to the southward. At the time of our visit to Bird Bank, there were many nests, some well constructed of sticks and sedge, while others had only a suggestion of nesting material. It is not uncommon to find the eggs laid on the sand with absolutely no nest at all. On this bank, the breeding birds have the frequent misfortune to lose their eggs and young through the action of the high tides, which, at times, sweep the bank clean and this prolongs the breeding season in some years, until late in August. Naturally, the Terns and Skimmers share the same fate, and there have been seasons known, in which not a brood was raised on the bank, although the birds made repeated efforts, only to lose each setting by the tides.

The Pelican normally lays three eggs of a dirty white color, and incubation consumes about four weeks. The very young birds are most repulsive looking objects, being entirely naked for the period of nearly two weeks, when a fine white down makes itself apparent in tufts all over the body, to be followed by the light brownish plumage of the wings and back, while the under parts remain white. The feeding of the young is a highly interesting performance to the observer. The parent returns from the sea with the catch, and is instantly set upon by the hungry young, who, one, two and three at a time, thrust their heads down the open pouch and choose a fish to their liking. Their appetites are amazing, and the parents are kept busy throughout the day.

As if to complicate matters for the overworked old birds, the young, when able to walk, desert the nest and wander about over the bank in large droves, which is, to say the least, confusing when the parent returns to look for its own young. The latter are perfectly willing to be fed by any and every old bird which comes, but the old bird is much averse to feeding any save its own individual offspring. The fish taken by the Pelican in this locality are, in the main, menhaden, which are not used as a food fish, and are therefore useless as a commercial asset.

Mr. John T. Nichols has published[1] the following interesting observations, made by Dr. Russel J. Coles on the method of fishing. "When the birds are feeding, the distance of their flight above the surface of the water is carefully regulated by the depth at which the fish are swimming and one, who has not especially studied this point by many careful observations, does not realize how accurately this is gauged. I have often seen a Brown Pelican suddenly dart forward and upward ten to fifteen feet higher and circle back over his prey before making his plunge, indicating that the fish was swimming at a greater depth than expected.

"The plunge is interesting in that it is always headed down wind. As it thrusts its head down, its wings are three quarters closed and extended backward as far as possible, thus throwing the center of gravity in front of any wing support, and the following wind instantly catches in the partly closed wing tips and completes the inversion, then by deft manipulation of its almost closed wings, it maintains its perpendicular position as it volplanes downward.

"It is necessary for such a heavy bird to rise against the wind, therefore, it is only a case of instinstive preparedness that the Brown Pelican always rises to the surface headed up wind in order to be ready for instant flight."

It is a great sight to witness several of these birds over the breakers engaged in procuring food. The quick dart, the resounding splash, and the upthrowing of the bill tells that, in almost every case, the fisherman has landed his catch. Complaint has been brought against the Pelican that it destroys food fish, but the fish taken are useless to man in almost every instance, and this fine species deserves rigid protection which should be accorded it at all times.

All the inhabitants of this bird city are finished fishermen. The Black Skimmers feed their young almost exclusively on small fry, the bill of the young being highly specialized in its make-up for this purpose. Their habit of immersing the lower mandible, which is longer than the upper, and literally skimming the surface of the water, has given them their name. This species breeds in abundance on the bank. The "nests" are mere hollows in the

[1] Abst. Proc. Linn. Soc. N. Y., No. 30, pp. 20–27.

sand, with a few bits of shell around the three to five eggs, which are of a creamy white ground color, handsomely splashed and blotched with shades of brown and black. The eggs vary in limitless fashion, I have found them almost totally unmarked, while others are very heavily blotched with the colors mentioned above.

The Royal Tern usually lays but one egg in this locality, although sets of two eggs are not uncommon. They are of a light grayish white, evenly dotted all over the surface with small spots of brownish, these spots of course, vary in size, being small, however, oftener than they are large. The young of both the Terns and Skimmers are covered with down when hatched, and are very hard to see when they squat, with outstretched neck, upon the sands. They are adepts at remaining motionless and are a fine example of protective coloration.

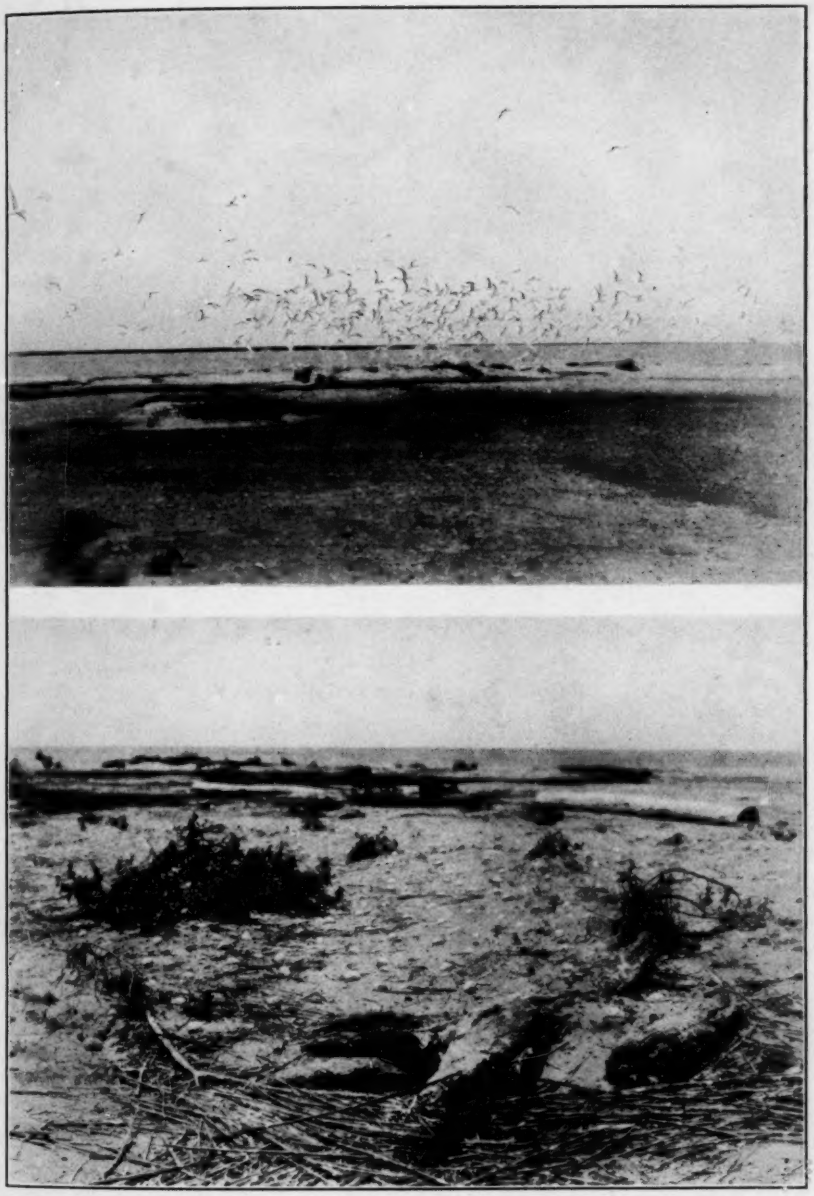
While walking through the Skimmer colony, I noticed large numbers of small, spherical objects dotting the sand around each nest. Examination proved them to be compact little balls made up of the scales, bones and vertebrae of the small fish which form their food, and which had evidently been ejected by the birds, in the same manner that Owls eject the pellets of fur, bones etc. of the small mammals which they prey upon. And so on we walked through the colony, picking our way between the numberless eggs, and the thought that kept presenting itself over and over was, how in the world was it possible for the birds to return and cover their own eggs without getting hopelessly confused in the hundreds that lay about. It is one of those wonders of nature that vies with the uncanny ability of the various species of birds that follow the trackless trails of the air in their wonderful journeys during the migratory season.

On going to the end of the bank, the birds wheeled and settled down upon their eggs with many screams and cries, but with far less confusion than would be expected from so vast an assemblage. The only other birds breeding on the bank were a couple of pairs of Willets, and their nests were found in the small clumps of beach grass that grew just above high water mark. After a couple of hours in this highly interesting locality, we walked back to the skiff, again causing the mass of birds to rise and circle over the sands in a deafening snowy cloud, then pulling out to the launch,

we hauled up the anchor and set out for Raccoon Key, a few miles to the northward to look for a colony of Least Terns.

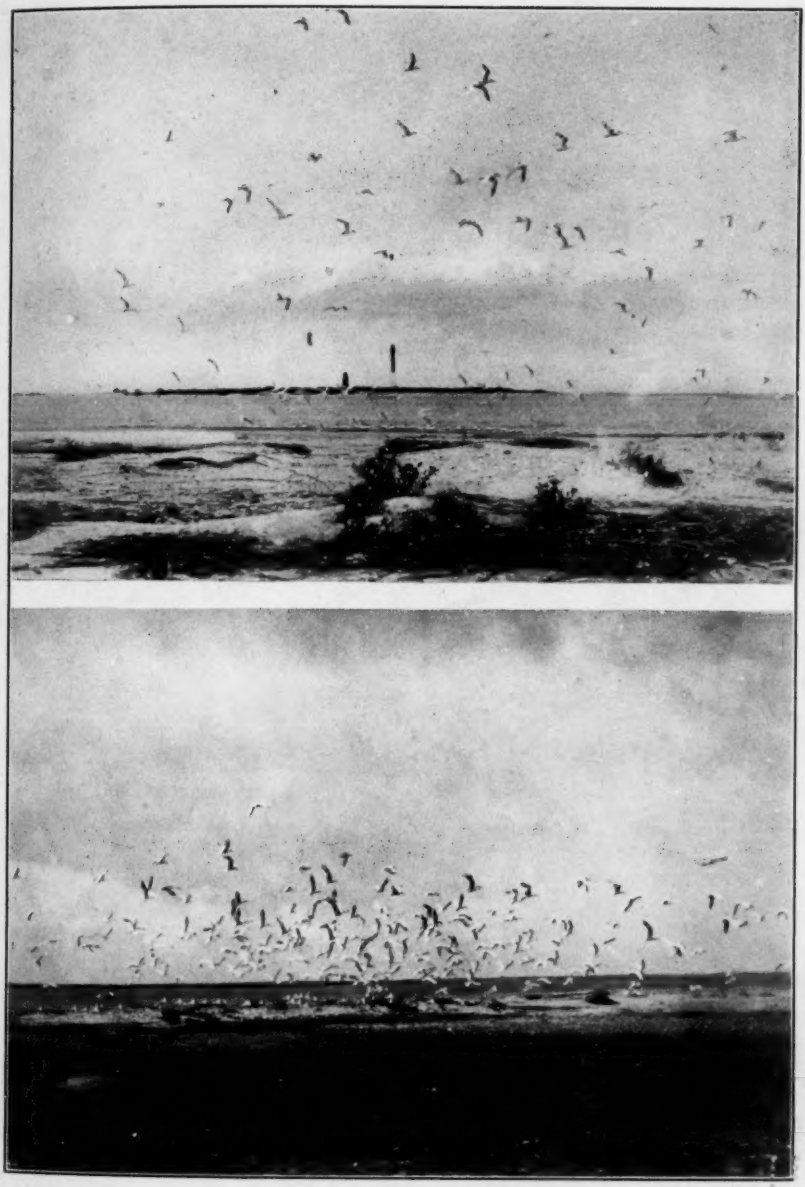
Raccoon Key presents a very different appearance from Bird Bank, and is of much greater size. It is a long, narrow strip of land about thirteen or fourteen miles in length, and from a quarter to a half mile in width, while Bird Bank is only a few hundred yards long and not nearly so wide. The ocean side of the Key is fringed by a small bluff-like eminence, four to six feet above tide mark, and shelves down to a broad flat expanse covered with coarse grass and weeds, which forms the center of the Key, while the landward side is bordered by a stretch of salt marsh.

Landing on the southern end, we walked toward the beach and soon came to a last year's breeding ground of the Pelicans. The mound like nests were everywhere, in various stages of dilapidation, in some cases only the mound of sand marking the spot where one of the homes once stood. Coming out upon a broad expanse of sand, covered with broken bits of shell, we saw the graceful forms of the little Sea-Swallows (Least Terns) springing from the sand on every hand. It seemed at first as though we had stepped into a land of pygmy Terns, when comparing them with their large relatives of Bird Bank. These beautiful little birds are marvels of grace on the wing and do not differ in behavior from the other species in regard to the actions they indulge in when their homes are being investigated. This was not a large colony, about seventy-five pair were all that we saw, but it was a gratifying sight to see even this number as this species was all but exterminated a few years ago by hunters for the millinery trade. Mr. A. T. Wayne writing in his 'Birds of South Carolina,' says that, "hunters came from the north with regular outfits to wage war on these poor, defenseless creatures and in one season alone, all the Terns breeding on Bull's Island were killed." For years after they were very rare and it is only in the past three or four seasons that they seem to be regaining, in a measure, their lost estate. The breeding habits do not differ from the larger Terns except that, the eggs being more protectively colored, are harder to locate against the neutral background of sand and shells which compose the "nest." The number of eggs is almost always three, but sometimes only two are laid. They are very handsome, being marked heavily, or lightly, with dark brown and lilac on



Photos by LeRoy Halsey.

ROYAL TERN COLONY AND ROYAL TERN NESTS, BIRD BANK, BULL'S BAY, S. C.



Photos by LeRoy Halsey.

ROYAL TERN COLONIES, BIRD BANK, BULL'S ISLAND, S. C. CAPE ROMAIN LIGHT HOUSE IN THE DISTANCE.

a grayish buff ground color. The birds were, as usual, much disturbed by our invasion, and after a short time we left them in peace and walked along the beach near the high water mark. Two or three nests of the Wilson's Plover were located here but not without a good deal of critical search, for they are very difficult to find, even when only a foot or so away. The eggs are so marked with fine black dots that they harmonize perfectly with their surroundings and often baffle the combined efforts of two or three searchers. These birds are very apprehensive while the nest is being examined and frequently try to lead the observer away by the well known ruse, practised so extensively by many of the shore birds, of feigning a broken wing and fluttering off over the sand with the most plaintive whistles.

More interesting was a nest of an Oyster-catcher, which held an incomplete set of two eggs, and which was found by the merest accident. Willets swarmed in the grass grown portion of the Key, several nests being located in a short time, and in two instances the sitting bird was all but trodden upon before flushing from the neat cup of dried grasses which held the handsome olive-drab eggs. The Willet is extremely noisy, and while at first the notes are pleasing, they rapidly amount to too much of a good thing, and one is glad to leave them and hurry on to a less loquacious community.

The only land bird breeding on the Key was a Nighthawk, and there was the egg, lying on a bare stretch of ground with no nest at all, but perfectly concealed by its coloration, which matched to a T, the ground about it. It seemed a far cry from the roof of a city building, where some Nighthawks rear their young, to a lonely Key of the ocean, but who can question the choice of this individual, who preferred the open spaces of sea and sky, to the roar and grime of the city.

The evening shades were falling as we made our way back to the launch, and soon after pulling up the anchor, and heading southward toward Charleston, the curtain of a southern summer night softly closed around us. The brilliant lamps of the velvet sky blazed and twinkled in multitudinous splendor, while a pair of Skimmers glided by the boat on silent, fitful wing as if to cap the climax of a day which had been nothing but a delight.

92 South Bay St.,
Charleston, S. C.

ON THE UTTERANCES OF THE KINGBIRD, *TYRANNUS TYRANNUS*, LINN., WITH ESPECIAL REFERENCE TO A RECENTLY RECORDED SONG.

BY LEON AUGUSTUS HAUSMAN, PH.D.

ON several occasions, in various New England and eastern states, and separated by intervals of several years, the writer has recorded vocal performances of the Kingbird (*Tyrannus tyrannus*) which seemed to be definite and recognizable songs. A recent review of old field note-books suggested that the material found therein relating to the notes of the Kingbird, be published, and especially the records of what we shall term the songs of this suppositive songless flycatcher. The observations on which this study is based were made in northern Massachusetts and New York, northern and central New Jersey, southern New Hampshire and Connecticut.

For purposes of convenience in classification and study, the various utterances of the Kingbird may be grouped thus: (1) call notes, (2) alarm notes, (3) chase notes, (4) victory notes, (5) flight song, and (6) matin song (described in this paper).

By call notes are meant those abrupt, apparently spontaneous utterances not called forth by an external stimulus (e. g. the presence of an enemy); notes which may be regarded as the simple uncompelled expression of the bird's individual existence. Chapman[1] speaks of the call note of a bird as "its simple 'I am here' or 'This is I.'"

The call notes of the Kingbird are two in number: (1), the most frequently voiced, a sharp, metallic double note; a sort of short shrill twitter, pitched about an octave above middle B or C,[2] and represented by the vocable, *kĭttĕr*. The first syllable is practically pure in tone, and delivered without vibrations; the second is tremulous and burred slightly by the presence of overtones. The term *kitter*, with its sharp t-consonants, seems to the writer to

[1] Handbook of Birds of Eastern North America.

[2] In recording notes there was used a whistle provided with a sliding plunger for modifying the pitch, and calibrated an octave above the ordinary chromatic pitch-pipe.

represent the peremptory, metallic, staccato character of the note more accurately than the vocable, *kipper*, employed by some ornithologists. The quality of shrillness is also better indicated by the t's than by the p's.

The note, *kitter*, seldom modified in pitch, may be regarded as the unit note from which are built up the various other utterances of the Kingbird, with the exception of the matin song. Occasionally only the first syllable of the note is uttered—a single, abrupt, penetrating *kĭt* or *kēēt*, which reminds one of the metallic squeak of the Rose-breasted Grosbeak (*Zamelodia ludoviciana*). Of this note I find only two records. The first occurs in Thoreau's *Journal*,[1] where the note is referred to as "that clear, plaintive *tilt tilt*, like the call of a Robin, somewhat"; and the second in Nuttall,[2] where it is described as a monosyllabic call, sounding in the ears of the observer like the syllable *tschēŭp*, of harsh quality, and "rather quickly pronounced."

The call notes may be varied from a single *kit*, or *kitter*, to a rattling call produced by a rapid repetition of the *kitter* element: *kitter kitter, kitter kitter kitter*. I have not seen allusion to the fact that these notes are closely similar, both in syllabification and general pitch (though not in intensity) to the call notes of the Chimney Swift (*Chaetura pelagica*). To the writer's ears the frequently-uttered, shortened call of the Chimney Swift, near at hand, seems nearly identical with the call of the Kingbird at three or four times the distance. There is a fall in pitch of nearly two tones, however, in the terminal notes of the call of the Chimney Swift, which is not the case in the call of the Kingbird. Again, the calls of a Kingbird in the distance nearly resemble the closing notes in the song of a Savannah Sparrow (*Passerculus sandwichensis savanna*) close at hand. Thoreau first commented on the similarity of the Kingbird's notes to the general notes of Swallows, writing in his *Journal*[3] "First Kingbird. Its voice and flight relate it to the Swallow." He was thinking, no doubt, of the quality and pitch of the notes, rather than of their phrasing. Minot[4] referring to the Kingbirds, says: "Their notes are shrill

[1] Journal Vol. 7, under date, June 10, 1855.
[2] Birds of the United States and Canada.
[3] Journal, Vol. 4, under date, May 14, 1852.
[4] The Land Birds and Game Birds of New England.

twitters which often resemble those of the Swallows." Forbush[1] has the same observation.

Kingbirds are constantly alert and vigorous, and frequently continue to utter their notes during the heat of the day, when most other birds are silent. Thoreau[2] picturesquely writes of this habit: "How still the hot noon; people have retired behind blinds. Yet the Kingbird—lively bird with white belly and tail edged with white, and with its lively twittering—stirs and keeps the air brisk."

During the nesting season the call notes are uttered at short intervals by both birds of the pair as they fly to and from the nest. The male may often be seen sitting on an elevated perch—while the female is incubating the eggs or feeding the young—giving vent to the call alone. At times the perching individual will fly out to meet the one returning with food, and accompany it to the nest giving energetic voice to the call meanwhile.

The alarm notes of the Kingbird are those induced by an attack on the birds, the presence of an intruder near the nest or young, or by the squeaking outcry made by a nestling in pain. The alarm notes can readily be called forth by the squeaking sound produced by exerting suction between the slightly parted lips pressed against the back of the hand, if the noise be made in the neighborhood of the nest. In southern Connecticut the writer once drew down an unusually sharp attack from a pair of Kingbirds whose nest lay concealed in the topmost branches of a large apple tree, by squeaking thus. The alarm notes, delivered almost into his ears, were disconcertingly, almost painfully, shrill and piercing.

Like the call notes, the alarm notes consist of a repetition of the syllables, *kitter*, many more times repeated than in the case of the simple call, given with greater vigor and sharpness, with a slight elevation in pitch. In the alarm call the syllable *kit* not infrequently occurs, exceedingly penetrating and shrill, and the call has the typical form: *kitterkitterkitter, kit kit kitterkitterkitter.* The differences between the alarm and the call notes are those of intensity, duration, phrasing, and sometimes of pitch, with the added—perhaps fanciful—element of vehemence.

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[1] Useful Birds and their Protection.

[2] Journal, Vol. 5, under date, May 29, 1853.

The chase notes are uttered when the bird is in pursuit of a marauder, when the *kit* and *kitter* notes are given with their maximum of vigor, sharpness, and rapidity. There is a definite and measurable rise in pitch in many of the notes, to an octave above middle C sharp or D. The *kitter* note is often uttered so rapidly as to rise into a prolonged, shrill, chattering, staccato cry. Flagg[1] adequately describes the birds during an attack as "screaming with a sharp and rapid twitter," and Nuttall[2] speaks of the notes as constituting a tremulous, shrieking twitter." Oftentimes, however, the phrases of the chase call are shorter, and voiced with less frequency than those of the alarm call, especially during the times when the bird is engaged in swooping down upon the head and neck of its adversary, or clinging to its back. In northern New Jersey the writer once witnessed the prolonged chase of a crow by a pair of Kingbirds, during which one of the individuals alighted upon its enemy's back just between the shoulders, and thus rode for a considerable distance (possibly some five or six hundred feet) assailing it meanwhile with fury. The vigorous efforts made by the Crow to dislodge its tormentor, bore witness to the warmth of the attack! During periods of such intimacy of attack few or no notes are uttered.

The victory notes (there seems to be no need of any other category of *post bellum* utterances) are those heard after the rout of a marauder has been accomplished, when the birds usually return to some elevated perch—during the breeding season commonly in the vicinity of the nest. The notes are similar to the call notes, consisting of single *kitters*, or the note repeated. After the long chattering chase cry ceases the birds not infrequently return to their perches in tall trees without giving voice to a single note, or with only the ejaculation of a periodic sharp *kit*, as though out of breath from their exertions.

Although the Kingbird has been excluded from among the true singing birds, it nevertheless gives voice, during the reproductive season, to two dissimilar vocal performances, which I think may properly be termed songs, if by songs we mean those irrepressible vocalizations which give expression to the emotions

[1] The Birds and Seasons of New England.
[2] Birds of the United States and Canada.

aroused during the nesting season. The first of these songs has been referred to by Hoffman[1] as a "mating performance," and the second is here described, it is believed, for the first time. Both songs may be regarded as nuptial songs, since they are uttered only during the nesting season, and are here referred to as the *flight song* and the *matin song* respectively.

The flight song is uttered while the bird is either mounting higher and higher with erratic, jerky flight, or tumbling earthwards from a considerable altitude, and consists of the *kitter* and *kit* notes, uttered with great rapidity and abandon. This song may be repeated many times, the flight antics being indulged in meanwhile, and reminds one—though only in its abandon and spontaneity—of the flight song of the Bobolink (*Dolichonyx oryzivorus*). The song is not more musical, nor more rhythmical, than the chase notes, which it closely resembles. Both are the result of an exuberance of physical vigor. Forbush[2] well describes the character of the notes by speaking of the bird during its flight song as "twittering fiercely all the time."

On several occasions the writer has recorded from different individual Kingbirds a song which was markedly different from the flight song in two particulars: first in the possession of a characteristic and regularly-recurring rhythm, and second in the possession of two new notes. This song has been heard only in the morning twilight hours, and may be represented by the syllables, *kitter kitter kitter—kĭt trēé wēēt, kitter kitter kitter—kĭt trēé wēēt,* repeated over and over again in a loud clear tone, the principal stress falling upon the syllable *tree* in the second phrase. The song is repeated many times, with unvaried rhythm, and with the same monotonous iteration as that characteristic of the song of the Least Flycatcher (*Empidonax minimus*). The notes are pitched about an octave above middle B or C, the note *tree* being half a tone or so higher. Each of the two phrases (of three notes each) occupy about three seconds, and the pause between them about two seconds. In the first phrase the three *kitter* notes— and there are invariably three—are rapidly uttered, but each is distinct. They do not differ from the *kitter* note of the call. The opening

[1] Birds of New England and Eastern New York.
[2] Useful Birds and Their Protection.

note, *kit* is likewise the same note as that present in the call. The two closing notes, however, are not found in any other association of notes uttered by the bird, and are characteristic of this song. They seem to partake more of the character of true song notes than any others voiced by the bird. The *tree* note, in particular, is clear and distinctly musical. The second phrase of the song is similar, in its general tone quality, stress, abruptness, and delivery, to the songs of the rest of the *Tyrannidae*, and is suggestive, more specifically, of the song of the Phoebe (*Sayornis phoebe*), though differently accented. The longest period during which the writer has recorded any one bird as uttering the song, was something exceeding twenty minutes. This record was made on the banks of the Connecticut River at Gill, Massachusetts, in June, 1923. The bird sang continuously, without a break, while perched on the topmost branch of a small hackberry tree. This song was delivered about 4:15 A. M. Eastern Standard Time. For the purposes of record this song is called the *matin song.*

The only other record of this type of matin song of which the writer is aware is that by Olive Thorne Miller.[1] With reference to a pair of Kingbirds which she had under observation she says that during the period of sitting, at 4:30 each morning the male would sing thus: "*Kr-r-r-r-r-ree be*! Kr-r-r-r-r ree be! The notes . . . were at first weak, uncertain, fluttering . . . But as the days went by they grew strong and assured, and at last were . . . joyous and loud . . . ." In Chapman's Handbook she writes again (probably alluding to this same early observation): " . . . but while the mate is sitting—and possibly at other times—he indulges in a very soft and pleasing song, which I have heard only in the very early morning." Mathews[2] says he has never heard such a song, but has noticed that in the early morning the birds seemed to be unusually vigorous. The song recorded by Miller seems to be a true matin song, but is a different one from that heard by the writer,—differing in the phrasing of the first portion of the song, the accent and notes of the second part, and in the intensity, of the entire performance.

[1] The Kingbird's Nest, Atlantic Monthly, Aug., 1890, p. 258.

[2] *Field Book of Wild Birds and Their Music.* In this work the notes which Mathews describes as those of the Kingbird, and which he locates in their place on the musical staff, are not the notes of the Kingbird, but of the Great Crested Flycatcher (*Myiarchus crinitus*).

SUMMARY.

The various cries and calls of the Kingbird, as well as the flight song, are all built up from the simple call notes, which are best represented by the syllables *kitter* and *kit*, and differ from one another in grouping, length and intensity. The flight song may be regarded as a true song, and is given only during the mating season. The matin song is seldom heard; is more musical in character than the flight song; possesses a definite song-rhythm and two new, true song-notes; is delivered only during the morning twilight hours; and is sung from an elevated perch.

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New Brunswick, N. J.

SOME NESTING HABITS OF THE BELTED PIPING PLOVER.[1]

BY GAYLE PICKWELL.

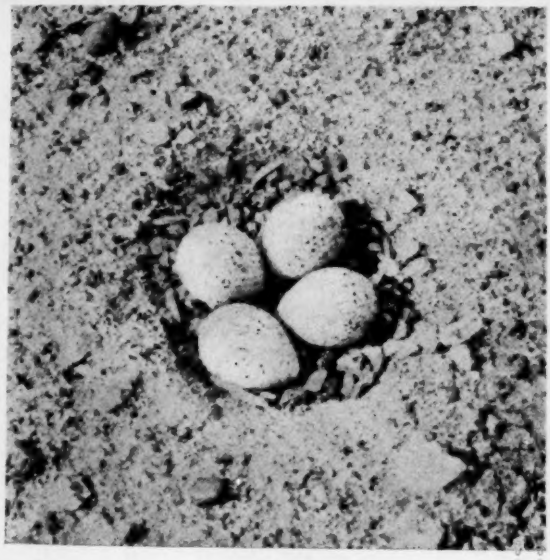
Plate XVI.

ON Saturday, May 20, 1922, the Nebraska Ornithologists' Union, on its annual bird hike, located a Belted Piping Plover's nest (*Charadrius melodus circumcinctus* Ridgway), on a strip of sandy beach at Capitol Lake near Lincoln. The nest of this bird had been reported only once before in the vicinity of Lincoln and that several years previously.

Within the last year or two a sand dredging outfit was erected on the south shore of the lake and, when operations were suspended, a large sloping beach of sand and gravel was left in that locality. This condition seemed ideal for the Plover and it was in this stretch of sand that the nest was found.

The day following the discovery of the nest, and for several days thereafter a great deal of rain fell and this prevented any detailed study of the birds or their habits. Mr. Frank H. Shoemaker, a member of the Nebraska Ornithologists' Union and an expert in bird-nest photography, visited the vicinity the following

[1] Studies from the Zoological Laboratory of the University of Nebraska, No. 144.



1. BELTED PIPING PLOVER BESIDE ITS NEST.
2. NEST AND EGGS OF BELTED PIPING PLOVER.

Tuesday, May 23. Not knowing the exact location of the nest he searched the region thoroughly and found not only the original nest but a second one as well. The second nest was about one hundred yards from the first. In addition to these two, a Killdeer's nest was located by Mr. Shoemaker on the same stretch of beach. This is interesting for the later opportunity it gave for comparison of the habits of this species and the Piping Plover.

The beach on which the nests were located extends about two hundred yards back from the water and is a large half-moon in shape. At the inner edge of the half-moon and away from the water are two or three little dunes of sand left by the operators of the sand excavator. Immediately back from the shore, some thirty or forty yards, is a stretch of smooth, fine sand. It is upon the inner edge of this stretch that the two Plovers' nests were located. Beginning within a few feet of the Plovers' nests is a strip of coarse grass and other herbage. This strip in turn fades out into another area of uneven, coarser sand and gravel. It is in this second strip that the Killdeer's nest was located.

On Wednesday evening, May 24, Mr. Shoemaker visited the nests again for a short time and rephotographed them. The following day, Thursday, May 25, a party of four, including the writer, visited the vicinity and made extended observations. The writer, secured a number of excellent photographs at this time also.

We were exceedingly surprised to find that there were a number of pairs of Piping Plovers in the vicinity—at least three, some claimed to have noticed four. Certain it is that there were more birds than nests accounted for. A thorough search of the entire beach was made and, although a large number of depressions were found in the sand that the birds had made, evidently, in their nest-making activities, no nests were found with eggs in them other than those already located.

The following day, May 26, Mr. Shoemaker and the writer visited the nests about two o'clock in the afternoon prepared to take photographs of the birds themselves. Observing very carefully through a high-powered glass we noticed both birds leave their nests while we were yet over a hundred yards distant. In all subsequent trips the birds behaved in the same manner: invariably leaving their nests upon our first approach, while we were

yet at a distance, in spite of any demeanor they might exhibit later in the same day or the same visit.

In our preparations to photograph the birds we proceeded very cautiously. A large block of wood that was lying upon the beach was first set up near the nest to accustom the bird to foreign objects. Retreating to a dune about a hundred yards away we prepared ourselves for a long siege, but, to our genuine astonishment, the bird was back upon the nest almost before we had seated ourselves.

Greatly encouraged, Mr. Shoemaker set up his tripod within six feet of the nest and ran a linen thread from the focalplane shutter about fifty yards back upon the beach. Compared to the water-soaked log, for which we had substituted the camera, this machine must have been very conspicuous to the bird. Any concealment, however, was out of the question in that large slope of bare sand.

We hoped that the bravery of the little bird would force her back in spite of the ogre in her front yard. Mr. Shoemaker pulled out his watch and we made preparations to wait at least twenty minutes before moving the camera; a longer wait might seriously chill the eggs. In exactly fifteen minutes, the writer with glass in hand, gave the signal to pull. The noise of the focalplane shutter, in crossing the front of the plate, was too much for the fear-tensed bird. She flew like a flash from the nest. This was the only time that the Plover was observed to fly from the nest under any provocation. Incidentally, it might be mentioned that the reaction of the bird was so exceedingly rapid that the resultant picture showed only a blur though the shutter was speeded to 1/10 of a second.

The plate was changed and the camera lowered to a new position. In spite of her scare, the bird returned in less than ten minutes. Again she leaped, but did not fly, as the shutter unrolled across the plate. Again the plate was changed. Thus, with intervals during which the bird was allowed to warm the eggs, six exposures were made. By repeating this process with a smaller camera at the other nest the writer succeeded in getting six more exposures.

Saturday, May 27, we went again to the beach and secured a number of photographs by the same tactics we had employed the

previous day. On this and the preceding day Mr. Shoemaker had brought with him a Graflex camera hoping to get photographs of the birds while they were simulating accident. Our efforts in this line were unavailing for, although the little Plovers would approach within a few feet in their anxiety, they were so small that to get good pictures by this method was impossible.

Sunday, May 28, the vicinity of the nests was visited and photographs were made of the little Killdeers which had hatched since the preceding afternoon and were yet in the nest at ten o'clock in the morning. The Plovers came out to greet us as usual and did their utmost to beguile us away from the vicinity.

Thursday, June 1, the writer visited the Plovers' nests alone and a series of photographs was taken of the birds as they came up to the nests. The nests were approached from the northwest and presently one of the little birds dropped down out of the sky onto the sand with his sharp "kee-wee, kee-wee" and ran briskly along before me. Shortly the long-drawn dismal "whooaah, whooaah" of another bird was heard and soon the six were made out that had been observed upon previous occasions. All had deserted their nests and were intent upon leading me astray. Efforts to locate the nest of the third pair of birds were unavailing.

On June 6, I was surprised when the Plovers did not come out with their usual vociferous greeting but soon found that the answer lay in that the eggs of one nest had hatched and the young had gone and the eggs in the other were pipped. Only three adult birds were seen and they did not evidence the solicitude that they had upon previous occasions. The camera was arranged for photographs. The birds, however, did not seem concerned about the safety of the eggs (it may have been because of the extreme warmth), and so, after waiting thirty minutes, the camera string was wrapped and I left.

June 7, at 9:00 A. M., Mr. Shoemaker visited the Plovers' nests and found one young bird out of the shell in the occupied nest. At 4:00 P. M. the writer visited the nest, saw the young bird and the remaining eggs. It was noted that the pipping of the egg shell was all at the larger end of the egg—at the greatest curvature. The pipping of the unhatched eggs had not increased beyond that of the preceding day. No egg shell belonging to the hatched bird was found about the nest.

Arrangements were made for photographs about 5:00 P. M. and while thus occupied one of the eggs heaved and cracked noticeably. While we watched the second bird hatched.

The egg had been merely cracked about the point of the bill previously and all subsequent cracking was done by the efforts of the bird to free itself from the shell. The head was cramped down into the larger end and it was here that the pipping had first started. After that first noticeable heave the convulsions continued at intervals of every few minutes until a wing was free and slipped out of a crevice made in the shell. Another struggle and the second wing appeared on the other side and then the large end of the shell was sufficiently loosened to see the doubled neck of the imprisoned bird. At the end of fifteen minutes the large end burst off and the bird stretched out its neck.

While yet the egg was largely intact it was noticed that the young bird was breathing violently. It may be suggested that this need for air causes the struggles which break the shell. Photographs were taken of the hatching process.

The bird first to hatch began to show response to the excitement about it and evidenced a desire to get up and run. It soon refused to remain in the nest. Finally, it left and while it was tottering insecurely away the parent bird came running up with little chuckles of solicitude. The young bird was enticed farther and farther away and finally it was left under the care of the male (presumbaly), and the female returned to watch over the nest.

The following day, June 8, the young Plovers were all out of the nest and, with the adult birds, had left the vicinity. Subsequent trips to the lake in the summer would occasionally show an old bird but the youngsters were never seen again.

The Piping Plover is so protectively colored on the sand that, were it not for its restlessness and the conspicuous black band across the throat, it would be invisible at thirty feet. As a consequence a good glass was absolutely essential to follow the Plovers' movements.

The nests themselves were merely tiny depressions in the sand lined with small pebbles that had rolled back into the bottom of the cup. No foreign material of any kind was used. The eggs are so spotted and mottled that their resemblance to the sand is

truly remarkable. Their markings are finer and more even than those of the Killdeer. This is very suggestive when one considers that the Killdeer, upon this same beach, was nesting back where the pebbles were considerably larger and more conspicuous. The eggs are sharply pointed as are all shore birds' eggs and are grotesquely large in comparison with the birds which lay them.

The most interesting thing about the Piping Plovers was their activities when one was near the nest. As an observer approached the nest he would be met by one of the Plovers dropping down out of nowhere, uttering its sharp "kee-wee, kee-wee" and striving its utmost to lead one away. It would then run briskly across the sand and disappear suddenly from sight when it stopped to crouch down and utter its long-drawn "whooaah, whooaah."

The solicitude of the birds increased as the observer approached near the nests and very soon the six birds would be made out all uttering a medley of cries and lamentations in a concert. When one was actually at the nest the distress and anxiety of the birds was piteous to behold. The bravery of these little Plovers in the defense of their nests was wonderful.

Upon the writer's first visit, when the party consisted of four or five, the Plover came within a very few feet of the visitors, her head low against the ground (I infer that it was the female), her wings beating up and down in a steady blur. Then, when assured that our attention was distracted from the nest, she turned and assumed a pose of complete distress: drooping upon the sand apparently with broken back, or broken wings, utterly helpless. At such times the bird uttered throaty croaks such as one would expect from a dying bird. The simulation was perfect.

If pursued, she fluttered off across the sand for a hundred feet or more. While we remained quietly by the nest both birds came up within a few feet and then turned in expectancy of immediate pursuit. Time after time they repeated this while we were near. Numbers increased their anxiety and their bravery. Rarely would they come nearer than twenty or thirty feet while one person examined the nests but when the number of people increased to three or four they would come up within a very few feet.

The variety of their cries and calls was amazing. At almost any period, while we were in the neighborhood, one of the birds

could be observed flying here and there with slow, wide wing beats, uttering a rapid "*kuk, kuk, kuk, kuk,*" It would shortly alight and wind it up with a long-drawn, weird "whooaah, whooaah" that seemed to come from no where in particular. The distress cries while one was near the nest were confined chiefly to a sharp "kee-ah, kee-ah." The reason for their name of "piping" became very apparent at such times.

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LEONARD BALDNER, SEVENTEENTH CENTURY SPORTSMAN AND NATURALIST.

AN UNRECORDED COPY OF HIS BOOK, CONTAINING HIS PORTRAIT.

BY JOHN C. PHILLIPS.

Plate XVII.

I CANNOT do better than begin with a passage from the last part of Baldner's quaint introduction, for it shows the real spirit of the man better than any modern effort. Let this fine old naturalist, who deserves the name of the Gilbert White of Rhineland, speak for himself.

"To the end that God Almighty be praised and acknowledged by us, we must not forget the benefits of the three Rivers which we, God be blessed, do here at Strassburg enjoy, viz., the Rhine, the Ill and the Breusch; in which there is no want of Fishes, Crabfishes and Fowls and all other things that live in the water, either in summer or in winter, which we are abundantly blessed with. In consideration of this and the delight I took therein, I was led to procure among these wonderful works themselves all fishes, crab-fishes, water-fowls, four-footed water beasts, insects, worms, and chafers and all living creatures that move in the water, as many as I could get which are found about Strassburg in fresh waters, and all of which I had in my own hands. I caused them to be painted in lively colors and every one called by its name; and as much as I could learn by diligent examination I described briefly every one according to my own experience.

Leonhart. Baldner. Seines alters. 39 Jahr

"First of all we meet in our own country with forty sorts of Fishes, all of which may easily be distinguished, one from another, with two score and sixteen sorts of water-fowls, and two score and twelve sorts of four-footed beasts, worms, insects and chafers.

"And if there be any that is fitter than I for the undertaking of this my poor and mean endeavors, I intreat him to take it in good part, what my defects have failed me in, for it comes but from a poor Fisher and Hunter, whose learning does not rise higher than that of Peter the Apostle, who was at work fishing all the night but caught nothing. In the beginning it was not at all my intention to make a book of Fishes or Fowls, much less of Insects, but because in the year 1646 I shot some strange water-fowls and caused them to be painted from life, as soon as I had done the same the delight and meditations which they inspired prevailed upon me to continue.

"Thus for the past thirty years I have cast my net and fisher's yarn in the name of the Lord and what I learned thereby I have delivered a little in writing. Done in the year 1653 on the 31st of December."

I have extracted the following information from Lauterborn's book (see below).

"Leonhard Baldner was born in 1612 at Strassburg, of a family in which the fisherman's trade had been hereditary for generations. He too became a fisherman. It is interesting in this connection that as late as 1902 there were fishermen of the name of Baldner living in Strassburg. The subject of this sketch passed all of his life in Strassburg. He was thrice married and had four children by each union. He died in 1694 and was buried in the churchyard of St. Urban's."

Though Baldner was not a learned man, his occupation and his inherent love of wild life combined to make him a remarkably keen observer of the animal kingdom, which was a closed book to the scholars of his time. Lauterborn calls him "the father of the zoology of the Rhineland." Most of his days, from his youth up, were spent in hunting and fishing. He was devoted to these pursuits, and in time rose to the position of warden of fisheries and forests in his own district. In addition, he was intensely curious to know the ways of the wild life with which he was so

much in contact. "No trouble, no exertion was too great for him, day or night, if it would serve to put into his possession some rare animal specimen."

One day, as we saw above, Baldner, while hunting, brought down what he subsequently described as "a beautiful waterfowl, of a species unknown" to him. So pleased was he with this "find" that he caused the bird to be painted by a Strassburg artist. This was in 1646. Pictures of others of his captures soon followed, and the collection gradually grew. Finally it occurred to him to investigate thoroughly "the nature, kinds, and attributes" of all the animals that he could find, and to compile the results. He went about his self-imposed task with characteristic carefulness and energy. But it was not until 1666, twenty years after he had begun it, that the "Bird- Fish- and Animal-Book" was completed. With two exceptions all the manuscripts which have come down to us are dated in that year. After the completion of the book, Baldner continued his investigations until 1687, when advancing age compelled him to lay them aside.

One of the interesting things in connection with Baldner was that his work attracted little attention among professional zoologists of the time, although he made many original observations. It was not published (and then the text only) until 1901, when a German professor in the University of Heidelberg, Robert Lauterborn, did full justice to this remarkable man. But various zoologists have made use of Baldner's manuscript, notably Francis Willughby, who purchased a copy when with John Ray and Philip Skippon he passed through Strassburg in 1663. (This is the one now in the British Museum.) Valenciennes, in his and Cuvier's 'Histoire Naturelle des Poissons', and von Siebold, in the 'Fresh-water Fishes of Middle Europe' also made use of Baldner's observations.

The copy of Baldner which came into my hands a couple years ago through an English dealer was not known to Lauterborn (1903), Hans Gadow (1907), or to J. H. Gurney (1921). Unfortunately I have not been able to trace it to its source, but in 1748 it was in the hands of one Philip Henry Tollman. At least he was the man who had the old German script carefully translated at that time, for his name appears twice in my copy in that connec-

tion. Since then (or for at least 150 years) it is *said* to have been in the possession of an English peer whose name I have not been able to learn through the dealer who sold the book to me. I shall therefore refer to it as the Tollman copy. The most interesting fact about this undescribed copy is the early date, 1653, the same as the Willughby and Ray copy in the British Museum. Through the kindness of Mr. J. H. Gurney of Norwich, England, I have carefully compared the translated text of the London copy (as regards the birds only) with my Tollman Ms., and as far as I can see they are nearly identical. The Tollman copy contains, moreover, a very elaborate title page (like the one in the edition de luxe of the Cassel library copy?) followed by what seems to be the only known portrait of Baldner himself. At least no mention is made of such a portrait by other biographers, and the London copy has none. This I have had reproduced to accompany the present sketch. The plates in my (Tollman) Ms. are beautifully fresh in coloring and measure about 12 by 7¾ inches, mounted on pages 20 by 13½ inches. There are 57 bird plates representing 55 species with legends in elaborate German script, all of which can be attributed certainly to Baldner, followed by a large collection of inferior pictures with French and German legends, the origin of which is obscure. This manuscript has plates showing almost the same list of birds as the London copy, but it lacks the Mute Swan, Red-breasted Merganser, Great White Egret, Black-headed Gull, Spotted Crake, Eider Duck and Curlew. The following birds, Common Stork, immature Great Crested Grebe, Stone Curlew, Kittiwake, female Smew and an extra plate of the Golden-eye, which do not appear in the British copy, are figured in this one.

The fish are even more beautifully executed than the birds and 43 species are represented on 40 plates. Of mammals there are only 3 plates (4 species) and of reptiles, amphibia, shell-fish and insects 7 plates. Some of the smaller species of insects and their larvae are so delicately drawn and colored that one looks at them with astonishment and admiration; they are so much better than average pictures of that period.

The Baldner plates of each group of the animal Kingdom are bound in with a great many other plates of marine animals and

insects, usually without legends. The fourth and last volume is a complete translation of the whole Baldner text by Philip Tollman.

It would not be fair to Baldner to leave this subject without some reference to his contributions to natural history, and I now quote a sample of one of the quaint descriptions which are written upon all the plates.

"The kingfisher is the handsomest among all the water-fowls and lives only upon fishes. They sit constantly by the water upon a brier or thorn, or when there is none they flutter over the water as steadfastly as if they were tied, and seeing a little fish, they fly downward into the water and catch it with the bill. But when the little fish is too big for them, they sit upon a brier or hedge and holding it fast with their bill thump it on both sides till it is dead; then he devours it. When all the waters are frozen over they get them to the spring water which does not freeze in winter and when, being hungry, they are stirred up they cry, gibt nichts, gibt nichts (it gives nothing). As for meat they are not commended for being good, for they smell very rankly. They make their nest by the water-side thus: they make a deep hole in the ditch bank, exactly as straight as a carpenter square, but the deeper the higher it is, and they lay their eggs in the hindermost part in a little hole upon the ground; and the hole is almost two ells long. They bring forth five or six young ones in the month of August and when one findeth a nest and doubteth whether or no there be young ones therein let him but observe in the morning and he shall hear the young ones crying, or when their dung runneth out of the hole, then be sure there are young ones therein."

Of course he was not by any means perfect in his knowledge, and we find several cases where the text applies to a different species than the one represented in the plate (see for instance the plate of the young Purple Heron which is confused with the Bittern).

Baldner was not content with mere description, for there are many notes on anatomy, particularly on the length of the intestines and the size and contents of the stomach. Of the Bittern he notes that they are not very "dainty eating," although they are allowed according to the law of the New Testament. The "claws, especially the hindermost, are good for tooth pickers." He found a mole and a perch in their stomachs besides frogs. "One may hear them cry

half a mile off [two English miles] which is produced through their long nostrils while the beak is kept closed and lifted high up." In this observation, as in other ways, he showed that he was well ahead of his time. It was his opinion that the female did most of the booming, but this is refuted by present authorities. With the Golden-eye Duck he notes that they have a "great throat" [meaning the bulbous expansion of the trachea?] and that nothing is found in their stomachs but sand! In spite of this, he says, they grow fat and he explains their toughness in an ingenious way. "There are not so many as ducks [mallards] catched [on account, I suppose, of their inherent shyness.] Therefore they wax older and their meat is tough."

With the Mallard he gave directions for telling the old from the young birds by the appearance of their feet, and he adds, "they have a very quick scent, in so much that they smell out a man, though they do not see him if only they have but the wind of him." This controversy as to the sense of smell in the Anatidae is still lively. Baldner makes a good many remarks about the value of a bird for table use and of the Smew he says in a waggish moment, "Many do not so highly commend them for meat as they do the other ducks, and yet for all that there is none left in the dish when they are roasted." His remarks about the Brant Goose (Schottische Baumgans) are interesting, for after referring to Gesner's theory that they are hatched from the fruit of certain trees he goes on to say that he kept several himself but never found that they paired or laid eggs. Then he adds, "on the 23d of Feb. 1680, I again got a Barnacle and drew out its guts and it was a male with small testes."

But more than this he was an amateur aviculturalist, a pastime which, I presume, was rare in those days. He kept a number of different birds at one time or another, and in the year 1648 he says in his account of a Gull (species?) that "he brought one up alive in a stove." [greenhouse?] He kept and tamed otters too, and made experiments with salamanders and fish.

In the Stone Curlew he noted the absence of the hind toe and other peculiarities and although the specimen which he had drawn was the only one he ever saw he realized at once that it belonged to a distinct group and made a very careful description of it.

Fish were apparently his favorite group and he made many painstaking observations upon their habits, migrations, rate of growth and the number of eggs in the ovaries. He tells of a wels (*Silurus glanis*) which was kept and brought up in a fish pond for fifty-one years until it had grown to a length of five feet. As Gadow pointed out in his paper in the London Field (1907, p. 765), there is very little about the life history of the salmon which Baldner did not know and it took about two hundred years to re-discover what he had made perfectly plain. Cuvier, Valenciennes, and many others after them ignored the truths which in simple and homely language we find written in Baldner's 'Bird-Fish- and Animal-Book.' He even took the trouble to count 148,800 eggs in the body cavity of one pike. He made a remark about trout which some of our systematists can well afford to ponder on for he noticed that they changed color according to their surroundings, "if put alive in a new tub they grow quite white and in a black one they turn dark, taking thus the color of whatever place they are in."

My references to Baldner as a student of nature have of necessity been all too brief. It remains to list the other known copies of his work and again to call attention to the fact that none of it was set up in type until 1901–1903 and that the plates were never reproduced. The following information is from Lauterborn's book.

1. *The London Manuscript, now in the British Museum.*

This manuscript contains 159 pages bound in a quarto only 12 inches by 8 inches, and illustrated. It contains descriptions of 40 fishes, 56 birds, and 52 other inhabitants of the water, such as mammals, amphibians, insects, worms, etc. The birds are in general arranged two to one page (unlike the Tollman copy). The preface bears the date 1653. The book was brought to England by John Ray and Francis Willughby, who bought it in Strassburg in 1663 from Baldner himself. An English translation of the text was made for Willughby and Ray by F. Slare and this also is in the British Museum, in MS.

2. *The Cassel Manuscript, now in the Public Library at Cassel.*

Dated 1666. It was made for the Elector Karl at Heidelberg. It is said to be the best and most beautiful of all and contains a title page.

3. *The Manuscript in Baldner's own Hand.*

The original of this manuscript was consumed in 1870 by a fire which destroyed the library in Strassburg, during the bombardment of the city . . . The lost manuscript contained descriptions and pictures of 72 birds, 45 fishes and crayfishes, and 52 other water-animals. Like the rest of the manuscripts (with the exception of the London copy), it bore the date 1666 as the year of completion. The foregoing characteristics may be presumed from the existing copies of the text, of which we have two:

a. The Hermann text copy, now in the University- and Public-Library, Strassburg; without plates.

b. Text copy in folio, now in the University- and Public-Library, Strassburg; without plates. This copy was made from the original manuscript towards the end of the 18th century by the son of Hermann who intended to edit and print Baldner's work.

4. *The Strassburg Manuscript with Pictures, now in the City Library, Strassburg.*

A folio of 114 pages, measuring 30 cms. long and 20 cms. broad, dated 1666, with additions up to 1680, but without the insects and worms. This copy is crudely executed and has called forth a lengthy discussion in which Lauterborn takes issue with one F. Reiber as to its origin. It may possibly be one that was copied from the original by Baldner's son Andreas.

5. *The Strassburg Manuscript in Broad-folio (from Hermann's Library).*

This manuscript, which is illustrated, has been missing since 1870, and all attempts to locate it have so far been without result. It belonged once to Reinbold Spielmann, Professor of Chemistry and Botany at the University of Strassburg, who lived between 1722 and 1783. He obtained it from the descendants of Baldner.

After his death, it came into the possession of J. Hermann (the same Hermann mentioned above) and later passed, along with Hermann's library, to the Museum of Natural History. It was examined here in 1860 by C. Th. von Siebold, who, in the introduction to his book 'Fresh-water Fishes of Middle Europe' (1863), pp. 33–34, remarks that this manuscript of Baldner is far less accurate and tidily gotten up than the Cassel manuscript, to which he likewise had access.

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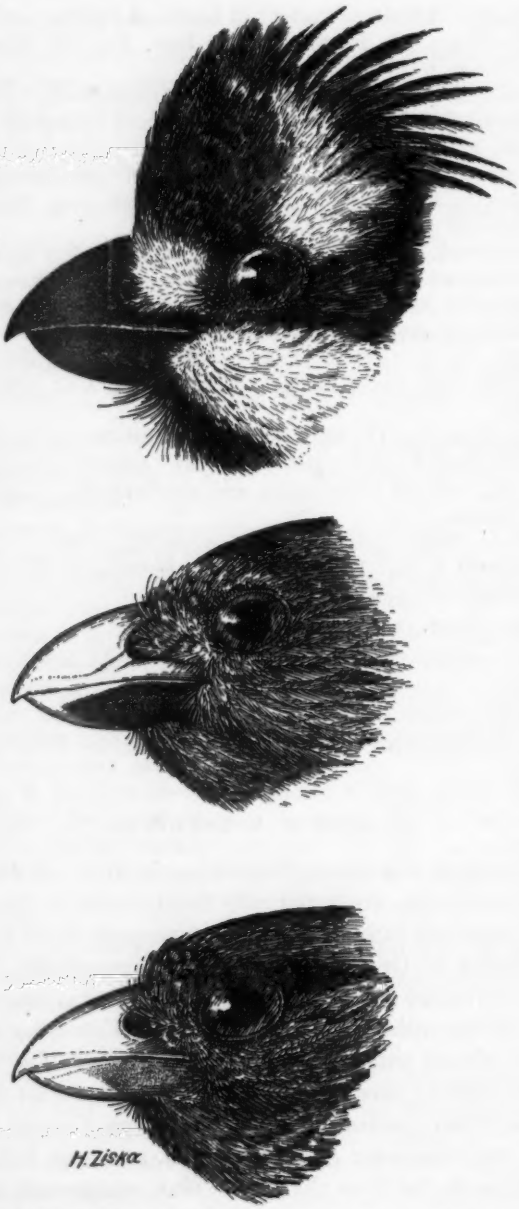
A FEW REMARKS ABOUT CYCLARHIS GUJANENSIS CEARENSIS.

BY ELSIE M. B. NAUMBURG.

THE American Greenlets, Vireonidae, in spite of their olive color and small size, are apparently nearly allied to the Shrikes. They are especially interesting from a taxonomic point of view for of two species of Greenlets closely allied generically, we have one with a distinct spurious primary, while it has become quite invisible in the other. In *Lanivireo* and *Vireosylva* the 10th primary is always small and frequently missing. The Greenlets reach their highest development in the genus *Cyclarhis* embracing at least a dozen species and subspecies from Central to South America, remarkable for their stout build and large bill.

The bill is shorter than the head; stout, compressed, distinctly



1. FALCUNCULUS FRONTATUS FLAVIGULUS. GOULD.
2. CYCLARHIS GUJANENSIS CEARENSIS BAIRD, "NESTING."
3. C. G. CEARENSIS BAIRD, "SEXUAL ORGANS SMALL."

notched and hooked at the tip. This family was formerly united with the Laniidae chiefly on account of resemblance in shape of bill of certain species to that of the Shrikes. The likeness, however, is not perfect, and there are other more important characters especially in the structure of the feet by which the two groups may be discriminated.

The bill of *Cyclarhis* in its compression, great depth, and other characters is very similar to that of *Falcunculus* (of the Pachycephalidae of the Australian region) which it also resembles so much in other characters as usually to induce authors to bring the two together either as adjacent genera or as belonging to closely allied sub-families.

Prof. N. K. Parker from an examination of the skull of *Cyclarhis* pronounces it the largest prototype of the Chinese *Suthora*, and, as he found that the latter has a skull which comes nearer to that of the Tits, he arrived at a conclusion which he expressed by calling *Cyclarhis* "this large archaic tit." A study of the series of *Cyclarhis gujanensis cearensis* in the collections of the American Museum of Natural History, showed a color character of the bill quite separate from structure, which I thought would be interesting to bring to the notice of other ornithologists, though I know that several have discussed this problem before me.

In the Roosevelt collection we have only one specimen of typical *Cyclarhis gujanensis*, a male taken at the River Juruena, 13° 13′–7° 25′ S., 59° 35′–57° 50′ W., at the place where the Roosevelt Expedition crossed. The Juruena is a deep-rushing stream 300 feet wide at the bottom of a rather deep valley; the sides are clothed with heavy forest; the hills beyond the valley have scrub timber and brush. This specimen agrees with a Cayenne bird, while three specimens from the lower Amazon (Forte Ambé, on the Rio Xingu; Faró, on the Rio Jamundá, and one from Utinga, Pará) being in fresher plumage, are slightly more buffy underneath.

There are six specimens of *Cyclarhis gujanensis cearensis* in the Roosevelt collection. Four of these specimens from Urucum (Nos. 127186, 128084, 127187, 128087) are adults with a very distinct plumbeous spot on the basal half of the lower mandible. The two others from Urucum, Nos. 128085, 128086, one of which

still retains on the sides of the occiput some fluffy feathers of the juvenal plumage, wholly lack this spot, the lower mandible being dark horn color, very slightly paler towards the tip. In a series of eleven specimens from Bahia secured by Rollo H. Beck, there are eight with a distinct plumbeous spot. The sexual organs of all were marked by the collector as distinct, swelling, or large, and two bear even the note "nesting." On the labels of three others without any trace of a plumbeous spot, the sexual organs are described by Beck as small. A series from West Minas Geraës (Agua Suja, near Bagagem) which I had the privilege of examining while working in the Munich Museum, is even more instructive. In addition to eight, with a more or less distinct plumbeous spot at the base of the lower mandible, there are three which in the absence of this mark (Nos. 111422, 111423, 111418; Munich Museum) agree with the specimens from Urucum and Bahia referred to above. A male, No. 111415, in the Munich Museum, shows on the same portion of the lower mandible occupied in the majority by the plumbeous spot, a number of minute plumbeous dots.

Hans von Berlepsch[1] believed *Cyclarhis wiedi* Pelzeln to be as perfectly valid a species as many others. He says it combines the long rufous superciliary stripe of *Cyclarhis gujanensis cearensis* with the uniform rufous under mandible (without any trace of a plumbeous spot) as in *Cyclarhis ochrocephala*. Berlepsch says the species *Cyclarhis ochrocephala* agrees with *Cyclarhis gujanensis cearensis* in coloration, but there is not the slightest trace of a plumbeous spot at the base of the lower mandible. He says he has not examined the specimens from Cuyabá and the Rio Paraná, but he has little doubt that these specimens also belong to *Cyclarhis wiedi*, having the uniform rufous mandible. Prof. Baird[2] describes a female from Paraná under the name of *Cyclarhis viridis* which he says belongs to *Cyclarhis wiedi*. He describes the bird as having a dark under mandible but without a distinct spot as in *Cyclarhis gujanensis*.

Dr. Hellmayr[3] for some time regarded the specimen without a

[1] The Ibis, 1888, Vol. VI. p. 88.
[2] Rev. Am. Birds, p. 392.
[3] Nov. Zool., 1908, XV, p. 23.

VENEZUELA
COLOMBIA
BRITISH GUIANA
DUTCH GUIANA
FRENCH GUIANA
ECUADOR
PERU
BOLIVIA
BRAZIL
PARAGUAY
URUGUAY
ARGENTINA
CHILE
MINAS GERAES
CEARA
Distribution of
Cyclarhis guianensis cearensis

plumbeous bill spot as specifically distinct and more nearly allied to *Cyclarhis ochrocephala*, but now I believe he fully agrees with my conclusions. From the preceding facts I conclude that the so-called *Cyclarhis wiedi* Pelzeln (type-locality, Goiaz, Brazil) is merely the immature stage of probably the bird of the year of the normal type, as has been intimated long ago by Dr. Allen.[1]

There seems little chance of the name *wiedi* coming into use as the birds inhabiting the Central Brazilian Plateau (West Minas, Geraës and Goiaz) agree in color and general character with *C. gujanensis cearensis*. However, I have not examined a sufficient number of specimens from those localities to determine this fact absolutely. *Cyclarhis gujanensis cearensis* as now understood ranges from eastern Bolivia all over the Brazilian Plateau, south to northern Sao Paulo (Rio Paraná and Barretos), east to Bahia, Pernambuco, and Ceará.

Cyclarhis gujanensis gujanensis (Gmelin).

Tanagra gujanensis Gmelin, 1788, Syst. Nat. I, ii, p. 893 (ex Buffon: "Verderoux," "Guayane," sc. Cayenne).

Specific and Subspecific Characters.—A stripe of maroon-red extending from the nostrils over the eyes and along the sides of the occiput; crown, nape, ear-coverts, cheeks and chin leaden gray; upperparts olive-green; throat and sides of breast greenish-yellow; middle of breast and abdomen white with grayish cast; sides and flanks olive-gray; under wing-coverts and inner margins of remiges sulphur-yellow; lower mandible blackish at base, rest brownish horn-color.

Specimens Examined.—Brazil: Foret 'Ambé,' Rio Xingu, 1 ♂; Matto Grosso: Juruena, Juruena River, 1 ♂; Utinga, near Pará, 1 ♀; Faró, Rio Jamundá, 1 ♀.

Prof. Baird[2] says that *C. gujanensis* has the legs dusky. In only one skin from Utinga, near Pará, did I find them dusky; in the others they are pale flesh-color.

Cyclarhis gujanensis cearensis (Baird).

Cyclorhis cearensis Baird, 1866, Rev. Amer. Birds, I, p. 391 (Ceará). *C. albiventris*, Sclater and Salvin, 1873, Nomencl. Av. Neotrop. p. 156 (Bahia).

[1] Bull. Amer. Mus. Nat. Hist., 1889, II, pp. 123–135.
[2] Rev. Am. Birds, I, p. 387.

Measurements of Males.[1] *Cyclarhis g. gujanensis.*

		Wing	Tail	Exposed Culmen
River Juruena, Matto Grosso, Brazil	1	73	59	17
Forte Ambé, River Xingu, "	1	70	55.5	16.5
Cayenne, French Guiana	1	70	55.5	16.5

Measurements of Females.

Utinga, near Pará, Brazil	1	69.5	56	16.5
Faró, River Jamundá, Brazil	1	68	53.5	16.5

[1] All measurements are given in millimeters and made with dividers, the wing retaining the curvature of its primaries as well as the bent position of the manus taken in drying.

Measurements of Males (Extremes and Averages) *C. g. cearensis.*

		Wing	Tail	Exposed Culmen	Collection
Chapada, Matto Grosso, Brazil,	20	71.5–77 (73.9)	57–66 (61.1)	14–16.5 (15.2)	A. M. N. H.
Tapirapoan, " " "	1	70	57	14	"
Urucum, " " "	2	73–75 (74)	60.5–64 (62.2)	15–15.5 (15.2)	"
Bahia, " " "	7	67.5–71 (69.7)	51.5–58 (56)	15–16.5 (15.7)	"
Brazil: West Minas Geraës, Agua Suja, near Bagagem,	4	71.5–76.5 (73.7)	61.5–66.5 (63.1)	15.5–16.5 (15.8)	Munich Museum
Brazil: Ceará, Serra Baturite,	3				
" " Juá, near Iguatú	3				
" " Quixada	2				
	8	71–74.5 (72.9)	55–63 (60.5)	15–18 (16.5)	Field Mus. Nat. History.

Measurements of Females (Extremes and Averages)

		Wing	Tail	Exposed Culmen	Collection
Chapada, Matto Grosso, Brazil,	10	67.5–75.5 (72.2)	53.5–67 (59.4)	14.5–17 (15.7)	A. M. N. H.
Tapirapoan, " " "	1	71.5	58	16.5	"
Urucum, " " "	2	72–74 (73)	60.5–65.5 (63)	14.5–17 (15.7)	"
Bahia, " " "	4	69–73 (71)	53–60.5 (57.2)	15–16.5 (16)	"
Brazil: West Minas Geraës, Agua Suja, near Bagagem,	4	71–73.5 (72.1)	59–64 (60.8)	16–16.5 (16.1)	Munich Museum
Brazil: Ceará, Juá, near Igautú,	2				
" " Quixada,	1				
	3	71.5–77 (74.5)	59.5–65 (62.5)	16–18 (17)	

Thamnophilus guianensis (nec Gmelin) Wied, 1831, Beitr. Naturg. Bras. 3, ii, p. 1016 (Campo Geral).

Laniagra guayanensis Lafresnaye et d'Orbigny, 1837, Syn. Av. I, in Mag. Zool. cl. ii, p. 9 (part; Bolivia).

Cyclorhis wiedii (nec Pelzeln) Pelzeln, 1868, Zur Orn. Bras. II, pp. 74, 137 (part; Bahia, Goiaz, Rio Paraná).

Cyclorhis viridis (nec Vieillot) Allen, 1889, Bull. Amer. Mus. Nat. Hist., II, pp. 123–127 (part; "adult bird in breeding season." Chapada, Matto Grosso); Salvadori, 1900, Bull. Mus. Torino, XV, No. 378, p. 3 (Corumba).

Specific and Subspecific Characters.—Entire crown, occiput and nape gray washed with ochraceous brown; frontal band and sides of crown rusty red forming a well-marked superciliary streak; cheeks and ear-coverts and a band across the hind-neck pale gray; entire upperparts yellowish-green; upper throat, breast, abdomen and under tail-coverts white washed with fulvous; chest and under wing-coverts bright yellow; sides of body yellowish-green.

Specimens Examined.—Brazil: Matto Grosso, Chapada, 20♂, 10 ♀; Tapirapoan, 1 ♂, 1 ♀; Urucum, 2 ♂, 2 ♀; Bahia, 7 ♂, 5 ♀.

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THE BREEDING AND WINTERING OF THE PALLID HORNED LARK IN WASHINGTON STATE.

BY WALTER P. TAYLOR.

ACCORDING to Ridgway[1] and the American Ornithologists' Union Check-List[2] the range of the Pallid Horned Lark (*Otocoris alpestris arcticola* Oberholser) is northwestern North America; the subspecies is said to breed in Alaska (except the Pacific Coast strip) and the upper Yukon Valley, and to winter south to Oregon, Utah, and Montana. Later information requires a restatement of the breeding range. On at least two occasions C. de B. Green is reported to have found the subspecies breeding in British Columbia. More than fifteen years ago he collected a set of eggs with the female bird on the high mountains above timberline between

[1] Bull. 50, U. S. Nat. Mus., pt. 4, 1907, p. 307.
[2] Ed. 3, rev., 1910, p. 219.

the Okanogan and Similkameen Valleys[1]; and on July 30, 1915 (authority of D. E. Brown, Seattle) Green collected a female specimen of the Pallid Horned Lark and noted seven breeding pairs with large young on Pearson Mountain, British Columbia. Brooks regards *arcticola* as the breeding form on all the high mountains of the Province, *Otocoris a. merrilli* being limited, in his experience, to the arid lower levels, and the breeding ranges of the two forms nowhere impinging on each other. During field work in the State of Washington in 1919 we found the subspecies breeding well south of the international boundary line. On August 5 of that year a small Horned Lark, as yet unable to fly, was captured at an altitude of 7,300 feet on Panhandle Gap, Mount Rainier. The locality is well above timberline, in the Alpine-Arctic Zone, and a favorite resort for Ptarmigan and mountain goat. The so-called Gap is in reality a broad ridge, to the north dropping off abruptly to the Sarvent Glaciers, on the south sloping gently to Ohanapecosh River. Although the date of capture of the young bird (August 5) seems a little late, at least for localities at lesser altitudes, the season on Panhandle Gap was at its height, and the ground, only recently uncovered by the snow, was blanketed with grass and flowers. On being picked up the young Horned Lark disgorged three locust-like insects and a small green worm. The mother remained close at hand while we watched the young bird, uttering a solicitous call-note resembling *chipew, chipew.*

During five seasons of field work in Washington we have noted the Pallid Horned Lark, and collected specimens,[2] at several points in the Cascades. August 5 is apparently the earliest date on which the subspecies has been actually recorded for the State in summer, though it is not impossible that the Pallid is a resident somewhere in Washington throughout the year. On August 6, 1918, a single Horned Lark was seen at an altitude of 7,500 feet on the ridge northeast of Cloudy Pass in the Chelan country. On August 17, 1919, two groups of Horned Larks, all badly molting, were observed at an altitude of more than 7,000 feet on Burroughs Mountain in Rainier Park. These birds may have

[1] Brooks, 'Auk,' XXVI, 1909, p. 62.

[2] I am indebted to Harry C. Oberholser for identifying specimens taken, and to Edward A. Preble for calling my attention to a reference I had overlooked.

bred in the vicinity, but undoubted migrants from the north began to arrive soon after. The northerners evidently appear first in the high Cascade Mountains, dropping to more moderate altitudes when driven out by storms. On September 3, 1920, a company of some 100 to 200 individuals was flushed from a grassy ridge top between 7,000 and 7,500 feet on Sheep Mountain, Okanogan County, Washington, near the Canadian boundary. In addition to the big flock, smaller groups of from 2 to 15 or 20 individuals were observed. The following day I found the same flock, or another, 100 to 200 birds, circling and feeding in the warmth of the morning sun on the grassy slopes near the main peak. At about the same time (on September 3, 1920), Stanley G. Jewett saw a small flock of Horned Larks near the summit of Castle Mountain, in the high Cascades near the upper Skagit River, not far from the international boundary. During the fall of 1918 (September 4 to 8) a company of from 6 to 8 individuals could ordinarily be observed at or above timberline, altitude 7,000 feet, on the Mount Aix ridge, which is east of Mount Rainier on the Yakima side of the Cascade summit; it was impossible to tell whether these Horned Larks had bred in the vicinity or were migrants. Horned Larks were encountered September 5 to 7, 1920, on Bald Mountain, east of Sheep Mountain, in Okanogan County near the Canadian boundary, at altitudes ranging from 7,000 to 7,900 feet. On September 17, 1920, a flock of Horned Larks containing perhaps 150 individuals was noted feeding among the herbs and on the snow close to the highest point on the Chopaka Mountain ridge, altitude 7,879 feet, this record being our latest for the high Cascades.

The surroundings in which the Horned Larks were observed in these Alpine-Arctic localities were very similar to those in which the species is usually noted at lower levels: the landscape was practically always wind-swept; the vegetation, while sometimes making a grassy sward of not a little attractiveness, was usually sparse and often depauperate; the ground was often extremely rocky and poor; and trees, when present at all, were the dwarfed and gnarled types of the timberline region.

The onset of wintry weather in November is followed by the departure of the Pallid Horned Lark from the heights and its

appearance on the plains of eastern Washington. George G. Cantwell observed a flock of some fifty individuals at Moses Lake, Grant County, on November 18, 1921. The Horned Larks were distributed over several acres of wheat stubble, and were shy, keeping constantly on the move. F. R. Decker reports the subspecies to be of common occurrence in winter in Benton County, especially in the Horse Heaven country. In this district, in company with Hepburn's Rosy Finch and the Dusky Horned Lark, the Pallid subspecies is often found in large numbers on the fields of wheat stubble. In 1917 flocks of 1,000 birds were seen. In severe weather the Horned Lark is easy to approach. On February 7, 1916, Decker observed a flock of about 300 Horned Larks, mixed Pallid and Dusky, in snow about a foot deep. A sheep-herder had fed his flock on the snow and as soon as the sheep left the Larks gathered where they had been. The latest record for the Pallid Horned Lark on its winter range in Washington is that of S. H. Lyman,[1] who reports a specimen taken near Walla Walla during the first part of March.

Specimens of Horned Larks taken by us on Mount Rainier, Mount Aix, Sheep Mountain, and at Moses Lake are all *Otocoris alpestris arcticola* Oberholser. Field identification of most subspecies of Horned Larks is difficult if not impossible, and there is always the chance that some of the flocks here referred to *arcticola* may have contained other forms. Even if this were the case our conclusions in regard to the Pallid Horned Lark would be but little affected.

An unusual fall record of the subspecies is that of an example collected September 18, 1897, by Dr. A. K. Fisher, at Oyhut, near the coast of western Washington, in southwestern Grays Harbor County.

The status of the Pallid Horned Lark in Washington may therefore be summarized as follows: The subspecies occurs as a common migrant and breeding bird at least from July to September in the Alpine-Arctic Zone of the Cascade Mountains south at least to Mount Rainier (Taylor); east to Chopaka Mountain (Taylor); and west to Mount Baker (J. M. Edson); in winter, as early as November and probably to March, it is found in the lowlands of

[1] Dice, 'Auk,' XXXV, 1918, p. 148.

eastern Washington, north and east to Cheney,[1] south to Walla Walla (Lyman)[2]; and west to Moses Lake (Cantwell) and Benton County (Decker); it is of accidental occurrence, during migration, in western Washington (A. K. Fisher).

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THE OUTER PRIMARY IN RELATION TO MIGRATION IN THE TEN-PRIMARIED OSCINES.

BY CHARLES K. AVERILL.

A FACT that seems to have escaped the attention of ornithologists is that the outer primary in the ten-primaried Oscines is not only of taxonomic value but that its length in relation to the wing length is an indication of power of flight and therefore of the extent of migration. The outer primary varies inversely as the wing varies in length, and, as extent of migration depends largely on wing length, we may determine much of distribution by this obscure member. This is well shown by the family Vireonidae, basing our tables on Ridgway's 'Birds of North and Middle America' from which work all the data used in this work, unless otherwise stated, are taken. The outer primary is called the 10th and the next one the 9th.

VIREONIDAE.

Group I. Five genera, *Neochloe, Laletes, Pachysilvia, Vireolanius* and *Cyclarhis,* containing altogether 175 species and subspecies. Wing generally averaging three times the length of the tarsus; outer primary about one half the length of the next. None of these species reach north to the United States.

Group II. Genus *Vireo,* 31 species and subspecies. Wing averaging three times the length of the tarsus; outer primary one-third to a quarter the length of the next. About 10 forms, breed within the United States mostly in southerly districts, none reaching the northern boundary except *V. huttoni obscurus,* which reaches Vancouver Island.

[1] Johnson, Condor, VIII, 1906, p. 26.
[2] Dice, 'Auk,' XXXV, 1918, p. 148.

Group III. Genera *Vireosylva* and *Lanivireo*, with 27 species and subspecies. Wing averages longer, three and a half to four and a half times the length of the tarsus; in about half the forms the outer primary is obsolete and when present is probably always smaller than in *Vireo*. Five species extend their breeding range beyond the northern boundary of the United States—the Red-eyed, Philadelphia, Yellow-throated, Warbling and Western Warbling, and Solitary Vireos. The first three lack the outer primary and are of easterly distribution or at least unrepresented in the southwest. The last two retain it and have affinities in the southwest which is the metropolis for birds of poor wing development. The following measurements from Coues' 'Key to North American Birds' are taken as evidence that the outer primary in the genus *Vireo* is longer relative to the wing than in *Vireosylva* or *Lanivireo*.

	Outer prim. in rel. to next.	Length of outer prim.	Ratio of wing to tarsus.
Vireosylva g. gilva	1/4–1/3	—	3.9
Lanivireo s. solitarius	1/4	.50–.66 ins.	4.
" *s. plumbeus*	1/3	.75	4.
Vireo vicinior	1/2	.75	3.4
" *n. noveboracensis*	1/2	.75	3.1
" *h. huttoni*	less than 1/2	—	3.2
" *b. belli*	2/5	—	3.
" *b. pusillus*	1/2	—	2.9
" *atricapullus*	=	.66	2.9

It should be remembered in regard to these measurements in inches that although they are not much greater in the genus *Vireo* the wing itself is much shorter. We have then in the Vireo family a somwehat regular decrease in the relative size of the outer primary with a northerly extension of breeding range and consequent increase of the length of the annual flight.

TURDIDAE.

The Thrushes show the same thing.

The genus *Planesticus* has the outer primary very variable in length. There are 14 species and subspecies of which *P. migratorius* is the only species to enter the United States. It has the shortest outer primary of all, about one-fifth the lengthof the next.

The genus *Hylocichla* may be arranged as follows:

I. Outer primary equal to or longer than the primary coverts. Northern limit Canadian Zone: southern limit Guatemala.

	Wing	Tail	Tarsus	Rel. of Wing to Tarsus
H. g. guttata	87.8	64.8	28.8	3.

II. Outer primary shorter than primary coverts. All reach South America in winter and several breed north to the Hudsonian Zone.

	Wing	Tail	Tarsus	Rel. of Wing to Tarsus
H. mustelina	109.	71.5	31.6	3.4
H. u. ustulata	94.5	68.9	28.1	3.4
H. a. aliciae	104.	73.	30.3	3.4
H. f. fuscescens	105.	74.4	30.4	3.4

The genus *Catharus* has sixteen species and subspecies all of Tropical America. Wing two and a half to nearly three times the length of the tarsus, thus shorter than in *Hylocichla;* the outer primary is decidedly longer than the primary coverts.

Other genera of the family are *Cichlherminea* (five forms); *Mimocichla* (9), *Haplocichla* (1) all of semitropical America with wing rather long, outer primary longer than the primary coverts; *Zeledonia* (1) a remarkable semitropical type with a rounded wing yet of good length, and a minute outer primary; *Ridgwayia* (1) from Mexico with a long pointed wing and outer primary less than one-fourth of the next.

Myadestes (14) wing moderate to long, rounded, and outermost primary longer than the primary coverts, one-third (*townsendi*) to nearly one-half (*melanops*) the length of the next. Townsend's Solitaire with the longest wing and shortest outer primary of any of the species is the only one to push north into the United States, going on indeed to Alaska.

Ixoreus (1) with wing long and pointed has the outer primary one-quarter as long as the next and breeds north to Alaska. *Sialia* (9) also has the wing long and pointed and the outer primary very small. *Saxicola* and *Cyanosylvia*, old world groups, breed far north and winter south and have the outer primary sometimes longer sometimes shorter than the primary coverts.

As in the Vireonidae the long wing goes with the small outer primary and the migrants all have this form of wing.

MIMIDAE.

In this family the outer primary is usually as long as the next (much less than one-half in *Oreoscoptes*), and as long as the longest secondary in *Calyptophilus*. Now the last genus is represented by only one species, in the island of Haiti while *Oreoscoptes*, with one species, reaches British Columbia.

Mimus, *Galeoscoptes* and *Toxostoma* stand intermediate in length of outer primary, with the Mockingbird, Catbird and Brown Thrasher as their most northern representatives. There are several tropical genera all with the outer primary longer than in *Oreoscoptes*.

SYLVIIDAE.

Group I, Polioptila (20). Wing moderate, rather rounded at tip; tail equal to the wing or longer; outer primary less than half the length of the next. Tropical and warmer temperate regions, *P. c. caerulea* reaching farthest north.—New Jersey, Pennsylvania and Iowa.

Group II, Regulus (6). Wing rather long but rounded at tip; outer primary about one-third the length of the next. Distribution northerly.

Group III, Acanthopneuste. Wing rather long and pointed; outer primary minute. Represented in North America by the Alaskan Willow Warbler migrating to southern Asia.

TROGLODYTIDAE.

The family of Wrens contains seventeen genera and 135 species in North and Middle America. Seven genera have the outer primary decidedly more than half the length of the next, and of these, six range wholly south of the United States while the other one furnishes a species, Bewick's Wren, which breeds in the United States but is rather southerly.

Four genera have the outer primary more than the length of the next, and of these one is semitropical, two (*Catherpes* and

Heleodytes) occur only in the southwest while *Telmatodytes* breeds north to our northern boundary.

Six genera have the outer primary about half the length of the next and here belong the Winter Wren (*Nannus*), breeding in the Canadian Zone, the Short-billed Marsh Wren (*Cistothorus*) which reaches Canada, the Carolina Wren (*Thryothorus*) of the southern United States and the Rock Wren (*Salpinctes*) which extends its range to British Columbia. The remaining genus *Leucolepis* is tropical.

Thus we see that in the Wren family where the migrations are never extended and the wing never becomes pointed we can still note the diminishing length of the outer primary in those species which do migrate.

OTHER FAMILIES

The Waxwings (*Bombycillidae*) are long winged birds, with the wing five times the length of the tarsus, while the outer primary is minute.

The Ptilognatidae have the outer primary much longer than the primary coverts, the most northern species being the Phainopepla of our southwest.

As may be guessed from the wing of the Starling as it passes overhead, the outer primary is minute.

The Skylark (*Alauda*) soaring as it sings till it becomes a speck in the heavens or passes out of sight, has the outer primary minute, much less than half the length of the primary coverts. The Shore Lark (*Otocoris*) breeding north to the Arctic Circle has the wing four and a half times as long as the tarsus and the outer primary hard to find. The Dippers (*Cinclidae*) Titmice (*Paridae*), Shrikes (*Laniidae*) and Creepers (*Certhiidae*) are wide ranging groups which furnish no long distance migrants and the wing is rounded. In the Nuthatches (*Sittidae*) it is rather pointed and the outer primary relatively smaller. In the Crows and Jays (*Corvidae*) the wing lengthens considerably in *Corvus* without any diminution in the outer primary, the only case of the kind noted, but the large size of this feather in the Crows and Ravens suggests the idea that it is large enough to function in flight instead of being a useless rudiment.

The remaining families—*Dulidae* and *Chamaeidae* have rounded wings and are of southerly distribution.

To sum up: No North American ten primaried oscine bird makes a long migration unless the outer primary is minute or apparently lacking; nor has any member of a tropical or semi-tropical group become a migrant in North America without showing the effect of its journeys in the form of the wing and the relative size of the outer primary.

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SOME RESULTS OF BIRD BANDING IN EUROPE.[1]

BY FREDERICK C. LINCOLN.

Plate XVIII.

THE phenomenal increase in the popularity of bird banding in North America, as a means of acquiring precise information bearing upon the problems of migration and life histories of birds, is responsible for a material interest in the results obtained by European investigators in this same field of research. The present

[1] In reading an account of bird banding in Europe the American reader should bear in mind that on a continent so divided politically and geographically as Europe, with the differences of race and language between different countries it has not been possible to organize banding, to use one system, or a uniform series of bands, nor one central control as in America; in Europe the banding has been done by single stations, or by scattered volunteers cooperating with the station in each separate country. American ornithologists have already seen and will appreciate more and more the very great advantage we have in the study of migration by reason of the uniform system extending the length of the continent, as well as the more uniform race of people and language; this advantage appears not only in greater probability of returns, but it makes it possible to organize banding stations along definite routes of migration.

While many American birds may travel far beyond the limits of the continent, many other species do not go beyond these limits or beyond this uniform system of banding control.

Again, the World War was a severe blow to progress in bird banding in Europe. Professor Mortensen had started serious study by means of banding in Denmark as early as 1899, and gradually it had been taken up by certain ornithologists in other countries and made good progress, especially from 1910 to 1914, but of course was largely prevented during the war and has made slow progress since.

Systematic trapping for the purpose of banding adult birds, and to recover them, has not been adopted in Europe to any such extent as in America. A

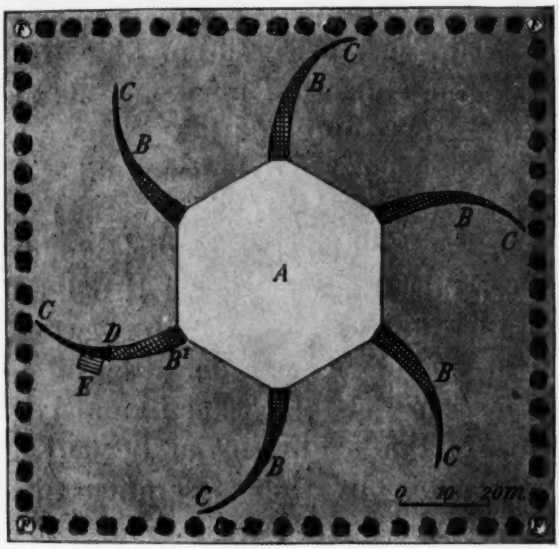

FIG. 1. THE BIRD OBSERVATORY AT ROSSITTEN, GERMANY, DESTROYED DURING THE WAR AND RESTORED (THIENEMANN)

FIG. 2. DIAGRAMMATIC SKETCH OF TRAP USED BY MORTENSEN TO CAPTURE DUCKS. "A." ALIGHTING POND; "B." CANALS COVERED WITH NETTING WHERE DUCKS ARE BAITED WITH BARLEY. WHEN THEY COLLECT AT "C," THE SLIDING DOOR "D" IS CLOSED. GATHERING CAGES ARE PLACED AS AT "E." AND POND IS SURROUNDED BY SHRUBBERY "F" (MORTENSEN).

paper is intended to present a résumé of the most noteworthy of these results and may be considered as the natural sequel to a paper by the writer outlining the history of bird banding and the problems to which it was believed the method might be advantageously applied.[1] It has been prepared at the earnest solicitation of Mr. S. Prentiss Baldwin, whose interest and generosity in this work it is a pleasure for the writer to acknowledge.

In presenting the following summaries of the information relative to the different species, the object has been as far as possible to consider the data as though obtained under the direction of a single agency, i. e., in the same manner that problems would be considered in North America, where the work is entirely under the direction of the Biological Survey aided by cooperative agencies. It is obviously outside the scope of this paper to present the details that would be of principal interest to workers in the ranges of the respective species, and for this same reason only those species have been selected for treatment for which there is available a sufficient amount of data to render this résumé of importance to American students. Analyses only are therefore presented of the returns obtained from banded White Storks, Great Gray Herons, Pintails, European Teals, Black-headed Gulls, Lesser Black-backed Gulls, Starlings and Swallows. There are many additional species for which data are accumulating, and with continued effort on the part of the banders there can be no doubt that other important contributions will be possible. The published reports available treat almost exclusively the data that have been amassed by single organizations, although papers appearing within the last two or three years have frequently made supplemental reference to the notable records of other workers. It is believed that all of the important papers have been examined, and a list of these

Mr. Lincoln says, the results are confined largely to chance returns mostly of dead birds, and to a few species most likely to be reported.

Bird banding in Europe, and in America also, has been used chiefly in study of migration, or a few chance age records, but in the opinion of some ornithologists the greatest value of banding will be in the intimate study of the daily life of the individual bird, and better understanding of the home life of each species. We believe that systematic trapping will open possibilities in bird study that have been realized as yet neither in Europe nor in America.—S. PRENTISS BALDWIN.

[1] "The History and Purposes of Bird Banding," by Frederick C. Lincoln, 'The Auk,' vol. 38, no. 2, pp. 217–228, April, 1921.

together with other works by European writers that have been of service in the preparation of this digest is added to the form of a bibliography. Much credit is due the painstaking efforts of these investigators and the author makes no effort to conceal the fact that in some instances he is quoting almost verbatim from their reports, supplementing their conclusions only by the addition of the deductions of other workers along the same lines.

With few exceptions, bird banding in Europe has been of a promiscuous character, that is to say, determined attempts to effect returns by systematic trapping have not been generally undertaken. A few workers in the British Isles and apparently also in Hungary have maintained small bird trapping stations and, as would be expected, have thereby materially increased the number of returns. Thomson (1921) has referred to the obvious importance of such work, as demonstrated in the course of the Aberdeen University bird-migration inquiry, when, through systematic trapping, three stations obtained as returns on the Blue Titmouse, the high percentages of 90.2, 53.3, and 42.2. In contrast to this, a much larger number of individuals of this species banded at other places where trapping was not practised yielded only 1.1 per cent returns. But as will be observed from the different species here treated the most notable contributions are those relating to birds which by virtue of their place in sport, or by other factors which cause them to be killed by hunters, still allow the element of chance to assume considerable importance. This is, however, the natural course of the initial stages of such investigations, and may be considered as approximating the course that will be followed to a greater or lesser degree with similar species in this country, although, through the application on a large scale of systematic trapping to the smaller species, American bird banders may be expected to forge ahead of their co-workers in Europe in the prosecution of such studies.

Because of the fact that practically all of the returns here utilized are from dead birds, obtained by chance, they are considered as applicable only to problems of migration and orientation.

White Stork (*Ciconia ciconia*).

Among the many birds studied in continental Europe by means of numbered bands, probably none have yielded results of greater interest than those of the White Stork. Occupying a prominent place in history and regarded with almost reverential respect by the peoples of many countries, it was but natural that storks should be given considerable attention by exponents of the banding method. The customary nesting sites of the birds have no doubt been contributory to this, for in taking up any new method of investigation, the species most readily obtainable is almost always sure to receive first treatment. On the other hand, despite the regard that popular fancy attaches to these birds, it is a curious commentary that such large numbers should be killed, particularly in those countries of Europe where they have long been considered as birds of good omen.

The center of abundance of this species during the breeding season is that portion of continental Europe from northern France, Belgium, Holland, Denmark, Germany, Austria, and Hungary to Scandinavia and Russia. In this region Storks have been banded by the Leyden Museum, Holland; by Prof. Mortensen in Viborg, Denmark; by the German Ornithological Society, at Rossitten on the Baltic Sea (See 'Bird Banding and Bird Migration Work at Rossitten on the Baltic Sea' by Theodor G. Ahrens, 'The Auk,' vol. 40, pp. 247–256, April, 1923) and elsewhere; and by the Hungarian Central Bureau for Ornithology. Returns have been received on a comparatively large scale so that it is possible to outline with reasonable accuracy the wintering areas, the routes thereto, and other facts of importance.

As shown on the map (fig. 1), the principal winter quarters of Storks from Europe, are located in Africa from the headwaters of the Nile (Lake Victoria Nyanza) south to the Transvaal, Orange Free State and Cape Colony. To reach these regions one route of travel may be sketched almost with certainty. The birds from Denmark evidently follow the peninsula of Jutland southward to the mainland where with constant accretions to their numbers the flight is continued southeastwardly through the valleys of the Elbe and Oder Rivers, the passes of the Carpathian Mountains and Transylvania, and the Balkan Peninsula to the Dardanelles.

Fig. 1.—The migration of the White Stork, as shown by banding records. (After Mortensen.)

Thence, skirting the shores of Asia Minor and Syria to the delta of the Nile, from which point the route is more or less directly south.

Another route, seemingly of lesser importance, is indicated by a series of returns from France, Spain, and northwestern Africa. It would appear that those birds breeding west of the Weser River, fly south and west through the valley of the Rhone to the Mediterranean coasts of France and Spain to Gibralter, thence across the straits to Morocco. From this point the flight of this group is somewhat obscure, and it is of course possible that the long flight across the Sahara Desert is undertaken with only the scattered

oases as possible points for rest and food. Whitaker (1905) states that in Tunis he has never met with this bird in winter and as supporting evidence that the trans-Sahara flight is actually made, as has been asserted by some writers, reference must be had to two returns from central Africa south of the desert. One is from the vicinity of Lake Chad and the other from a point to the south and about midway to the Nile. In view, however, of the connecting link afforded by this latter case the suggestion is made that occasionally wanderers reach such western points from the north and south flyway in eastern Africa. It is also quite evident that prolonged flights do not appeal to this species, which is demonstrated by the fact that the flight across the Mediterranean is avoided by taking the circuitous land route previously outlined.

The dispersal of young birds and the possibility of the colonization by them of new areas, together with the probable ages attained by birds in a state of nature, are questions that hold much interest to the investigator. Returns to the point of banding have been largely from adults, and it is therefore advantageous to consider other returns obtained principally by Dr. Thienemann of the Rossitten bird observatory. Several young Storks banded in East Prussia and Mecklenburg have been killed or recaptured within comparatively short distances of the points of banding. Two or three of these were recovered at points only about 18 kilometers (about 7 miles) from the stations where banded. It is nevertheless peculiarly significant that these recoveries were not effected in the season immediately succeeding, but all after a period of at least three years, while in a few cases, the time extended over four or five years. The hypothesis immediately presented is, that the White Stork requires a period of not less than three years in which to reach sexual maturity, a deduction that would appear to be well justified. Shenk (1923) has presented interesting data relative to the number of young produced during a term of years by these birds. He found that 2,199 pairs raised in eleven years 5,790 young. The record year was 1915 when 136 pairs raised 509 young, while the lowest was 1918, when 21 pairs raised only 72 young. Considering the records for the entire period of eleven years, an average propagation coefficient of 3.07 per cent is obtained.

This species is one generally credited with long life but although

the banding of Storks was started by Mortensen in 1899 and by the German and Hungarian agencies in 1903 and 1904, the oldest bird for which the record has been made available is one that carried a Rossitten band and which was killed when eleven years old.

A matter of incidental interest relates to the speed of travel which is rather slow as would be expected of such a bird. One Stork banded about 120 kilometers northeast of Berlin, was observed to leave on August 19, 1908. Seven days later (August 25) it was killed at Kassa Bola, Hungary, a distance of 640 kilometers, or 247 miles, which represents an average daily flight of a little more than 35 miles. Mortensen has figured the speed of flight during migration at an average of 300 kilometers per day (96 miles). This was computed on the basis of the long flights from Jutland to the Orange Free State, a distance of 24,000 kilometers (14,880 miles).

Great Gray Heron (*Ardea cinerea*).

Herons have been banded wherever found by investigators in all countries, but the only project that has yielded any quantity of data is that conducted by Prof. Mortensen (Saxtorph, 1922).

A heronry in North Zealand, Denmark, was worked during 1910, 1911, and 1912, with the result that 186 nestlings were banded, yielding (to 1922) 70 returns. Eleven countries (including Denmark) are represented in these records, extending from Sweden south to Algeria. Four returns were recorded from England and Scotland, all the others (except one from Sweden and one from Hungary) coming from countries lying south or southwest of the point of banding. It is therefore apparent that these birds perform their migratory flights over the well-known coastal route, following in a general way the western shore line of Europe. In Denmark banded Herons have been taken in almost every month of the year, while other winter quarters appear to be found over a large part of western Europe. The areas most favored seemingly are the regions around the mouth of the Elbe River and the rivers of Spain and Portugal. A few birds returned and were killed in subsequent seasons as breeding birds in the original colony, and many of the returns are from birds secured while the carriers were

still young, but a few have succeeded in avoiding capture for several years. The record for longevity is held by one that was nine years old when killed.

Herons also have been banded on a considerable scale in England and have yielded several recoveries but all are either from the immediate vicinity where they were banded or from more distant areas within the British Isles.

Pintail (*Dafila a. acuta*).

Particular interest attaches to game birds by virtue of the fact that comprehensive results of banding may be confidently expected at an early date. This is, of course, due to the great number of returns that are sent in by sportsmen.

For some reason migratory game birds of the Anatidae have been largely ignored by both the German and Hungarian agencies and our attention is therefore necessarily confined to the records brought together by Aberdeen University, by British Birds Magazine, and particularly by Prof. Mortensen, of Viborg, Denmark. With the present species, the investigations of Mortensen offer almost the only material, as the few recoveries of birds banded in the British Isles are all from relatively short distances from the point of banding.

The breeding range of the Pintail as given by the 'List of British Birds' extends from 72 degrees north latitude south to about 50 degrees but also occasionally to southern Spain, the delta of the Rhone, and Hungary. The winter range extends to northern Africa including Egypt and Abyssinia, and to India, Ceylon, Burma, China, and Borneo. In the British Isles this Teal is a resident and is a regular visitor from the continent between September and April.

By means of a specially built trap or "duck-decoy," Mortensen (1914) banded 320 Pintails at the island of Fäno on the west coast of Denmark during the fall seasons of 1908, 1909, and 1910, (Plate XVIII fig. 2).

From these birds 67 returns or 21.5 per cent were obtained, a most excellent percentage when it is considered how many different countries were involved in the returns. These data indicate with great accuracy the breeding and winter ranges and the route fol-

lowed by the individuals of this species that pass through the region where the banding was done.

The principal breeding area of these birds is shown (fig. 2) to

Fig. 2.—Migrations of the Pintail. The island of Fäno where most of the birds were banded is shown by a spot enclosed by a circle. (After Mortensen.)

extend from Lapland (Muonio River) and Finland (Uleaborg), east to the tundra of northern Russia bordering the White Sea (Archangel). The winter range is indicated as extending south and east from the latitude of Fäno, through the valley of the Rhine, and along the Bay of Biscay thence to the northern shores of the Mediterranean Sea (Gibralter, Seville, Valencia, and Aude), Italy (Ferrara, Umbria, and Capua) and the eastern shores of the Adriat-

ic Sea (Jugo-Slavia). A bird taken on April 29, 1910 at Nizhni Tagilsk, Siberia, on the east side of the Ural Mountains, was probably en route to the breeding grounds by an interior route, not used by the majority of the flocks, while another taken near Kief, Russia, on July 29, 1909, may have either been a breeding bird or a male that had wandered south into the interior after the breeding season.

The migratory flight to the south and the gradual working back with a moderation of the weather is well illustrated by the returns. One bird was secured in Scotland (Edderton) on November 20, 1908, another was captured in Ireland (Tyrone) in April, 1909, and another at Devonport, England on December 10, 1909. Dr. Eagle Clarke (1912) has already shown the British Isles to be the winter home of some of these birds that breed in more northerly latitudes on the continent, an assertion that is substantiated by these data. Sixteen of the banded birds also were recaptured during fall migrations at Fäno, Denmark, demonstrating the well established character of the southwest route along the coast which is followed by a majority of the individuals of this species in successive seasons. The records contained in this series may be considered as one of the most successful examples of results obtained by an intensive application of the banding method, and one that is hoped may be checked and extended by similar activities in other parts of the range of this almost cosmopolitan Duck.

European Teal (*Nettion crecca*).

According to the List of British Birds, the European Teal breeds in Iceland, the Faroes and in continental Europe and Asia north to about 70 degrees north latitude, decreasing in numbers south to the Mediterranean, Turkestan, and the Amur Valley. In winter it is found south to the Canary Islands, Abyssinia, India, China, and Japan. It is a resident species in the British Isles, although in winter its numbers are greatly increased by the arrival of visitors from the continent.

From the above outline of the range of this species it is evident that a great number of birds must be banded before any comprehensive report can be made on their periodic movements. This has not yet been done and it again becomes necessary to confine

our review largely to those records obtained by Mortensen(1908), supplemented by a few from birds marked in England and Scotland with bands from British Birds Magazine and Aberdeen University respectively (Thomson, 1923) from the island of Fohr off the western coast of Schleswig-Holstein with bands from Rossitten bird observatory and from Leyden, Holland, with bands from the Leyden Museum.

By reference to the published reports it is noted that Mortensen banded 102 Teal at the island of Fäno, Denmark, in October, 1907, from which 22 returns have been obtained; 149 were marked

Fig. 3.—Migrations of the European Teal. The dotted lines represent the isotherms of 39° and 43° for the month of January. Spots enclosed in circles denote points where banding was done. (After Mortensen.)

with British Birds Magazine bands, yielding 17 returns; and 28 were banded during the course of the Aberdeen University investigations, producing 2 returns. The number of records from other sources is small (fig 3).

As Mortensen's birds were banded in the fall it is apparent that they were on migration and no clew is afforded regarding their breeding grounds, but one taken in the following spring (April 12, 1908) near Stockholm, Sweden, probably denotes a bird at or near its nesting area. The Scandinavian peninsula is very likely the summer home of a great many of the Teal migrating through western Europe for among the returns of birds carrying British Birds bands, there are two (banded in Staffordshire and Wigtownshire) that also were recovered in southern Sweden during the months of July and August respectively, whilst a third, banded at Essex on February 14, 1910, and recovered near Hamburg in northwestern Germany on August 8, 1910, may either have bred in the vicinity or at a point farther north, in which latter case the bird was on migration when killed.

As is well known, this Teal generally prefers a mild climate being in this respect comparable to the American species of *Querquedula*, and it is, therefore, not surprising that Ireland with an almost frostless winter, numerous marshes and a network of streams should be favored by them as wintering grounds. The same may be said for the region in the western part of France between the rivers Loire and Gironde. By following the isotherms of 4° and 6° C. (= 39° and 43° F.) for the month of January, Mortensen has discovered that the regions included between these lines, cover the areas mentioned above and it is from them that most of his Teal were reported. As will be observed from the map the French and Irish areas are connected by the records of a few birds that were taken in southern England. After pursuing a southeasterly course down the west coast of England and including almost the whole of Ireland these isotherms continue to southeastern France where they turn abruptly eastward, crossing northern Italy, the Adriatic Sea, and Jugo-Slavia. The winter range of the banded Teal is carried through these regions with remarkable fidelity as is indicated on the map.

The fall migration to these areas is probably by a main route

down the coast of the continent, supplemented by a line of flight that crosses the North Sea to the British Isles from southern Scandinavia, where it would most likely meet a line of birds moving southward from Iceland. Eagle Clarke has already recorded the fact that at Fair Isle (midway between the Orkney and Shetland Islands) Teal are fairly common during both spring and fall migrations, indicative of a regular and possibly important flyway that as stated above, may have its origin in Iceland and Scandinavia. From observations at light stations on the east coast of England, it is known also that there is a regular movement of birds from the continent to the British Isles, so that there may be a continual arrival in that country of birds that leave the continental route at any point along the English Channel. It is furthermore not improbable that many of the exotic Teal wintering in France proceed thereto via the English-Irish flyway, although this would imply a roundabout course. Some weight to this hypothesis is gained from a consideration of the dates of the capture in France of Teal marked at Fäno, most of which are included in the period from November 9 to February 15, and by the fact that there are but few returns of these birds from the coastal areas immediately south of the point of banding.

A Danish Teal captured in the marsh of Las Marismas at the mouth of the Guadalquivir River, in southern Spain, probably indicates the southern limits reached by these birds.

Black-headed Gull (*Larus ridibundus*).

As in America, so in Europe bird banders have given much attention to the colony breeding birds, which furnish large numbers of both young and adults for banding purposes. Of such birds, there are two or three species of Gulls, the banding of which has furnished a considerable quantity of data pertaining to their movements after the nesting season. Among these the Black-headed Gull (*Larus ridibundus*) offers the best case for consideration, made doubly so through the capture in American waters of two birds banded in north-central Europe.

This species breeds in the Faroe Islands and in Europe generally from southern Scandinavia and northern Russia southward to the Mediterranean, Sardinia, and Asia Minor, and eastward through

temperate Asia to Kamchatka. In winter it visits North Africa and southern Asia, including India, China, Japan, and the Philippine Islands. It is resident in the British Isles and in other portions of temperate Europe.

The southern and eastern coasts of the Baltic Sea contain many

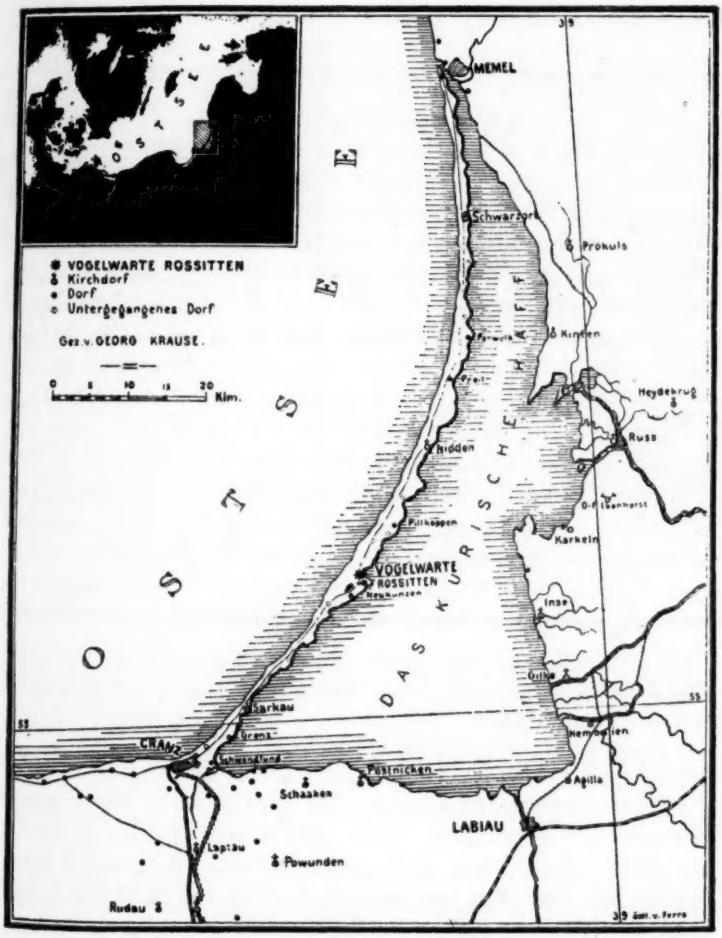

Fig. 4.—Map showing the location of the Rossitten bird observatory on a sand-spit on the southeast coast of the Baltic Sea. (Thienemann.)

large colonies of these birds, one of chief interest being in the neighborhood of the German bird observatory at Rossitten (Pl. XVIII fig. 1 and text fig. 4), forty or fifty miles north of Königsberg. The "gull marsh" as Dr. Thienemann calls it, has figured largely in the banding activities of that station, and it is from that point that the most surprising returns have been received. In a manner comparable to *Larus franklini* of America, the Black-

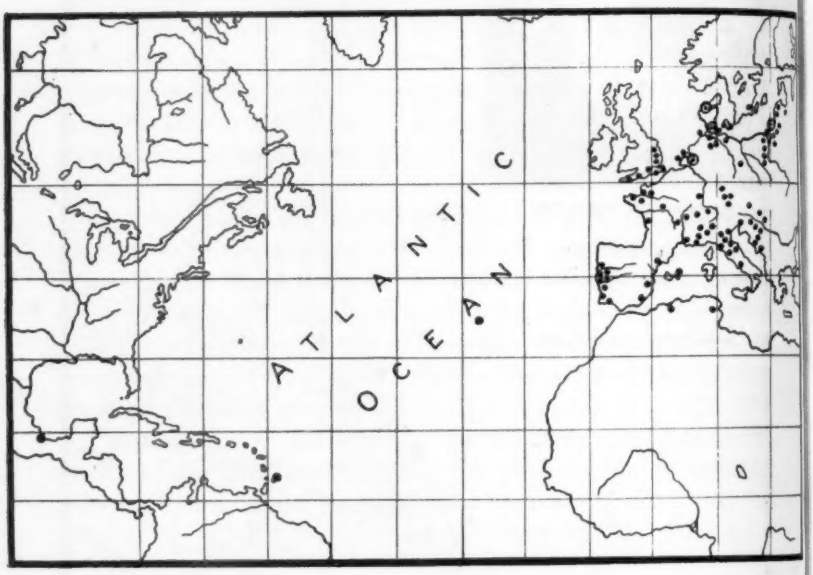

Fig. 5.—Migrations of the Black-headed Gull. The returns of particular interest are those from the Azores, British West Indies, and the vicinity of Vera Cruz, Mexico.

headed Gull of Europe breeds in the marshes of inland lakes and it is to such colonies that attention has been given by Austrian and Hungarian ornithologists. Prof. Mortensen and his assistants also have banded these birds in the colonies along the Danish coasts, Dr. Van Oort has banded them in North Holland, and between 1,100 and 1,200 were banded in Scotland and northern England during the course of the investigations by Aberdeen University.

Returns in large numbers have been obtained, indicating with much accuracy the southward movement to winter quarters (fig. 5). In studying these data, it must be borne in mind that the migrations of the Laridae are usually performed in a desultory manner, the birds wandering along in a leisurely fashion, although holding to the general direction dictated by the season, but only occasionally making the long non-stop flights characteristic of many other groups. An example of the exceptional cases is found in a young bird marked June 25, 1911, in North Holland, and recovered on the Mediterranean coast in the south of France on August 9, 1911. Generally speaking, however, the Black-headed Gulls adhere to the rule above mentioned, as the returns indicate that the long journey via the coast line is followed by a large percentage of the birds. This route takes them along the coasts successively of Germany, Holland, Belgium, France, Spain, Portugal, and Spain (again) to the north African coast where the winter months probably are passed. From this main flyway there are several offshoots or branches, marked by the principal river courses that are encountered. Foremost amongst these is the valley of the Rhine which is evidently followed by the migrating birds as long as a southerly direction is maintained, but at Basel, Switzerland, the birds appear to cross the Jura Mountains, in order to reach the north and south valley of the Rhone, which then becomes the flyway to the coast in the vicinity of Marseilles. There is no doubt but that many birds remain in that region for the winter, working gradually along the coast to the east and west, but it would also appear that others continue the movement along the Spanish coast to a point where meeting the travelers from the Atlantic seaboard—the flight is ended on the coast of Morocco. The returns also show that other birds prefer the shorter flight to southern England, where conditions are such as to permit their wintering. The flight to such points is obviously from the coastal or southwestern route.

Another flyway of much importance is one that takes an almost due southerly direction, crossing the Vistula and the Oder, and passing between the Carpathian and Reisen Mountains to the valley of the Danube thence along that river to a point approximately opposite the Gulf of Trieste in the Adriatic Sea, which is

reached in part via the River Save and its tributaries, and in part by a short cross-country flight through Jugo-Slavia. The northern shores (both east and west) of the Adriatic Sea, support a large number of the migrants, while there is further evidence that at least a few birds continue south through Italy and cross to Tunis via Sicily.

The flight of two Gulls from Rossitten to American waters is of exceptional interest, offering parallel cases to the American Common Tern that was found in West Africa. One of these Gulls, banded at Rossitten on July 18, 1911, was recovered near Bridgetown, Barbados, British West Indies, during November of the same year, while the other was captured during the following February (1912) near Vera Cruz, Mexico, in the Gulf of Campeche. As a possible connecting link that may indicate the course followed by these transoceanic travelers, reference may be had to the record of one that was banded in Yorkshire, England, and which was recovered from the Azores during its first winter.

Lesser Black-backed Gull (*Larus f. affinis*).

A recent paper by Dr. Thomson (1924) presents an admirable analysis of 153 returns received from a total of 3,865 birds of this species banded in the British Isles, chiefly on the Faroe Islands, off the coast of Northumberland or at Foulshaw, Westmoreland. These birds also have been banded to some extent by Dr. Thienemann at Rossitten.

The two races of this species breed generally in northern Europe from the Faroe Islands and Scandinavia eastward through Russia to the Dvina River. The winter range extends south to Arabia, western India, the west coast of Africa, the Canary Islands and the Azores. Generally speaking the two subspecies may be considered as eastern and western races, but as there appears to be a certain intermingling during migration and on the winter range no attempt is made to separate the banding records.

A well defined migration is performed, the coastwise route being favored and the returns from birds marked in England and on the Faroe Islands are well connected from the Gulf of St. Malo on the west coast of France, southward along the French coast, the north and northwest coasts of Spain, the coast of Portugal, and the south-

west coast of Spain to Gibraltar. At this point the route divides, one line turning eastward along the coast of Spain and crossing to Algiers, Sardinia, and southern Italy, while the other continues southward across the Strait of Gibraltar to Morocco, the Rio de Oro, the Canary Islands and Senegal; a total distance of about 3,000 miles.

The bird recovered in southern Italy (Calabria) was banded near Danzig and, as Dr. Thomson points out, there is no definite proof that some or all of the birds that reach the Mediterranean area may not have crossed overland from such a point as the Gironde estuary to the Gulf of Lyons. Such a course is obviously much shorter than the long coastwise journey via the Spanish and Portuguese coasts, but from the fact that Gulls are more or less nomadic it may be considered doubtful whether they make any effort to search out the most direct route to winter quarters. There are moreover, very few returns from the interior that would indicate such flyways. Only one of these, a Rossitten bird taken at Plauen, Saxony, a month after banding, appears at all suggestive of an overland route to the southwest.

The other inland records do, however, offer some basis for belief in a cross-country flight leading almost directly south. All are of birds with Rossitten bands. One was recovered thirteen days after banding at Saromberke in central Roumania and another, taken twenty-two days after banding, was reported from Belgrade, Serbia. The farthest point reached on this presumed flyway, is marked by a bird banded in October and captured during the following May in the delta of the Nile.

There are a few records of birds banded both in England and on the continent that are curious in that they cannot be definitely applied to any of the well marked highways. Rossitten birds recovered in Denmark shortly after banding do not appear to have any special significance unless the carriers were merely flying westward to join the main stream of migrants working down the coast. An English Gull taken on the west coast of Norway in September of the same year in which it was banded can only be considered as an exceptional case of wandering. Another bird banded in southern Sweden and recovered in Essex, England, twenty months after, also is lacking in special interest.

Starling (*Sturnus vulgaris*).

Studies of the migration of this species early attracted the attention of bird banders in Europe, resulting in a great number of birds being marked in England, Scotland, Norway, Denmark, Germany, and Russia. The returns obtained are of considerable interest and have been recently summarized by Dr. Thomson (1922).

Dr. Thomson's paper deals primarily with the data amassed by British Birds Magazine, but in order that his analysis be as complete as possible, the records from the investigations of Aberdeen University also are included, together with a short résumé of the outstanding records from other countries. As a result of the two British projects 472 returns were available, from a total of 9,498 banded birds, the equivalent of 5 per cent. Dr. Thomson explains that the number of recoveries is somewhat artificial due to the retrapping activities of the markers, but according to American methods of operation these records in themselves are of considerable value, although it is clear that part of these cases should be classified as "repeats."

In analyzing the data, it is shown that birds banded in summer, both as adults and fledglings, are mostly sedentary, for of 119 returns of birds banded at that season, 105 are from the vicinity where they were banded. Thirty of these were banded as adults, and 75 as nestlings. These data cover a period of six years, most, however, being secured during the first two years after banding. Of the returns from nestlings six (two each in the second, third, and fourth years) were reported as breeding at or near the place of marking, while five adults were reported as breeding returns to the original locality. Only 14 distant returns were received from these summer banded birds and none of these were outside of the British Isles. There is, however, a record of a nestling Starling, banded in Kent, on May 22, 1908, by Dr. C. B. Ticehurst (1910), which was returned from near Boulogne, France, under date of October 8, 1908.

Birds banded in winter yielded a total of 323 returns, 307 being to the region where they were banded and 16 coming from a distance. It is evident from a consideration of these records that the winter Starlings of the British Isles comprise a mixed popula-

tion those native to the area and winter visitors from the continent, a conclusion that is largely substantiated by records from mainland stations. It would also appear that of the native birds some may be strictly sedentary, while others are migratory within the limits of the British Isles. Many of these records do, in fact, confirm the conclusions reached from a study of the returns from birds marked in summer.

The records of Starlings banded in England and Scotland and recovered in the summer from the continent present a fairly accurate indication of the area to which at least some of the British winter-residents are native. These regions include Norway, Sweden, Denmark, Finland, and northern Germany (two from Norway, coming from north of the Arctic Circle). There are also a few records of winter banded birds recovered from distant points in succeeding winters. Such evidence must be considered as negative for they are not sufficiently numerous to show whether or not the birds at the time of recapture were merely late in starting migration, were already en route, or were already established in winter quarters different from those occupied at the time of banding. Dates of recovery do not render much assistance in these cases as they are all either from the beginning or the close of the winter season. One bird, banded at the lighthouse on the Isle of May, Firth of Forth, Scotland, on October 12, 1913, was recovered on January 29, 1914, from County Antrim, Ireland, showing clearly a bird of passage. In addition to the British cases summarized above, there are thirteen records of Starlings banded on the continent and returned from England, Scotland and Ireland. These originated at Heligoland, Viborg, east-central Sweden, Mecklenburg, Latvia, Courland, and western Russia. As previously stated these appear to substantiate the conclusions reached from a study of the records of British origin, for the reason that they were banded mostly in the summer while in almost every instance their recovery was during the winter.

Other records from birds marked on the mainland are not particularly numerous but they are sufficient to indicate that such migrations as are made by this species are from northeast to southwest. (fig. 6.) Recalling the more or less sedentary habits of the Starling in some regions, the flights of a few individuals

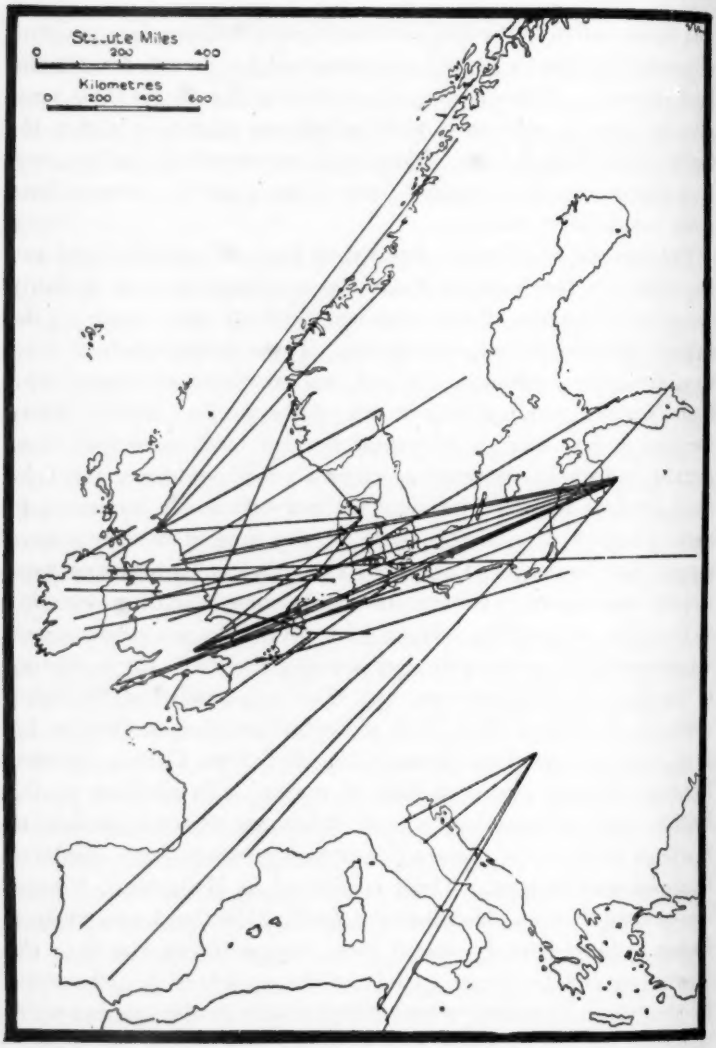

Fig. 6.—Migrations of the Starling. Each line indicates the points of banding and recovery of a banded Starling but is not intended to represent an actual line of flight. (Thomson.)

are decidedly remarkable. Such an instance is the case of a young bird banded at Wiborg, Finland, on June 8, 1914, and recovered

previous to July 26, 1915, from Aude in southern France, and of two birds marked at Lubeck and Hanover in May and recovered in Holland during July of the same year. Two Starlings banded in central Germany (near Leipzig and Magdeburg) were recaptured in southern Spain and Portugal respectively, while of seven nestlings marked in Hungary, two were recovered from Ancona and Rovigo, Italy, and the other five from Tunis, North Africa.

In drawing conclusions from these investigations Dr. Thomson states (loc. cit.) that "Many British native Starlings are sedentary while some are migratory within Great Britain or from Great Britain to Ireland, and except for one record of a short cross-channel journey, there is no proof from this source that any of these native birds emigrate to countries abroad. British winter immigrant Starlings come from Denmark, southern and Arctic Norway, Sweden, Finland, northern Germany, the Baltic States, and western Russia. Records of Starlings marked abroad also show journeys from Finland to southern France, from the Baltic States to northern Germany, from Denmark to Holland, from northern Germany to Holland and Belgium, from Holland to Belgium and northern France, from central Germany to Spain and Portugal and from Hungary to Italy and northern Africa."

Swallow (*Hirundo r. rustica*).

As is the case with all small non-game species, returns from this species are not numerous and much intensive banding must be done before definite contributions to our knowledge of their movements will be possible. The Swallow is, however, selected for inclusion in the present paper by virtue of the fact that what data are available are of considerable interest as bearing on the oft-repeated theory that with some species, those individuals that breed in the most northern latitudes, make the longest migratory flights, passing entirely over the inhabitants of the intermediate zones which are presumed either to not migrate at all or to perform journeys of much shorter lengths. The assertion has also been made that it is the young birds that occupy in winter the northerly regions, not yet having the strength and endurance to make the prolonged flights of their parents to more southern latitudes. The records from banded Swallows would appear to lend strength

to the former theory while refuting general acceptance of the latter.

The European Swallow breeds over a large part of the continent and the British Isles, wintering in Africa, India, and Australia. It must, however, be recorded that they have been observed in England in every month of the year, although occurrences during the period from the first of December to the middle of March can only be considered accidental.

Banding of this species has been done at several points in England and Scotland under the auspices of British Birds Magazine and Aberdeen University, and also in Holland by the Leyden Museum, in Schleswig-Holstein by the German Ornithological Society, and at points in Hungary by the Hungarian Central Bureau for Ornithology. Most of them were banded as fledglings but a few adults were captured for the purpose. In point of distance covered some of the returns rival those obtained in the case of the White Stork, as the same winter quarters are shown to be favored by a great many of the birds from England. Seven returns from birds banded in that country have been secured in South Africa, an air-line distance of over 7,000 miles, which easily places them in the class of land birds having annual migratory flights exceeding 10,000 miles (fig. 7). The route utilized in making this flight is scarcely indicated, for although a few birds banded in England have been recovered from France, there are, with two exceptions, no returns from the vast intermediate regions that must be traversed by the migrants. The exceptions are the record of a bird banded at Overyssel, Holland, and recovered on October 1, of the same year from Tangiers, and another banded on July 31, 1921 at St. Nicholas, near Cardiff, Wales, and recovered in December, 1922 from the upper eastern Luozi district, Belgian Congo. As Witherby has pointed out, the bird represented in the latter case was most assuredly in its winter quarters and not en route to a more southern latitude. But the locality is a full 1,700 miles from the nearest of the other records in South Africa, showing how widely separated in winter may be two birds that in summer are occupants of the same restricted region. A return from a Swallow marked in Schleswig-Holstein and taken near Lake Constance, Switzerland, shows little more than a line of flight almost due south from the place of banding.

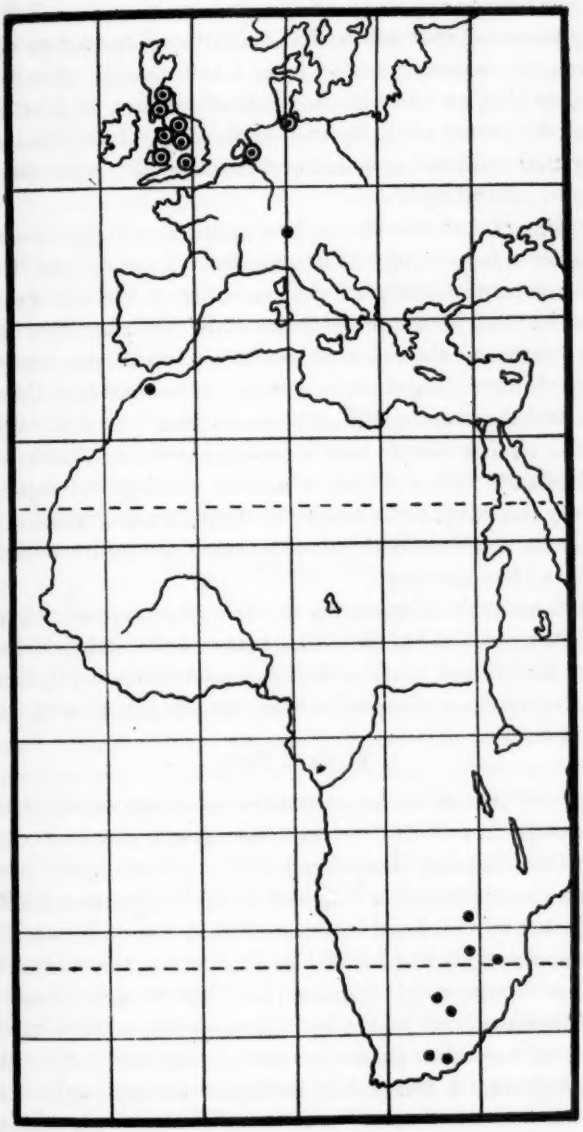

Fig. 7.—Migrations of the Swallow. Spots enclosed by circles denote points of banding.

With reference to the age of the birds making these long flights it may be stated that seven of the eight were banded as nestlings and were all recovered within from 5 to 8 months after banding. The other bird, an adult banded in Staffordshire, on May 6, 1911, was not recovered until December 23, 1912. It would therefore appear that with this species age has no bearing upon the length of the migratory flight.

Supplemental to the above data applying to migration studies are a series of returns, obtained in Scotland, England, and Hungary, which constitute most gratifying evidence of the strength of the homing instinct possessed by these birds. In a series of 15 Hungarian returns to the point of banding, 11 birds are represented, 2 of which have yielded three returns each. Seven of these were adults and five were nestlings when banded. Corroborative records of a similar nature also have been secured in both England and Scotland, British Birds Magazine having obtained fifteen or twenty records of birds banded as fledglings, and which returned to the same neighborhood; in one instance the return was effected two years after banding.

A curious angle is given to the investigations of this species by the statement of Shenk (1923) that of 9,000 individuals of the Swallow and House Martin (*Delichon urbica*) banded in Hungary, he has not received one return from outside the country.

Birds of Prey.

Species of this group have received attention mostly from Dr. Thienemann, but Mortensen and Skovgaard also have obtained returns from banded Hawks and Kites. There is not available adequate data to permit a diagnosis of their migratory flights, but a few instances will be of interest.

Two Sparrow Hawks banded in Pomerania, Germany, in July 1913 were recaptured in France (La Verdiere and Chambost in Alliers) in November of the same year, while a third banded in Switzerland was taken three days later at a point 30 miles distant. Two Rough-legged Buzzards (*Archibuteo lagopus*) carrying Rossitten bands from Torne Trask, Swedish Lapland, which were banded on July 7, 1911, were recaptured, one on November 26, 1911 in the vicinity of Vienna, Austria, and the other on April 12,

1913 at Guhrau in Silesia. Other returns for this species are from relatively short distances from the place where they were banded. The Common Buzzard (*Buteo buteo*), also has yielded a few interesting returns, one banded on May 19, 1917 at Schaffhausen, Switzerland, being recaptured at Bordeaux, France on December 1, 1917; one from the Jura Forest District in East Prussia, banded on May 30, 1913, was retaken on February 15, 1914, at Sagan in Silesia; one banded at Rominten in East Prussia on June 8, 1913, was killed at Schladen in the Harz Mountains on December 12, 1913, while another banded on June 12, 1913 in the Zehdenick Forest District of Germany was recovered in March 1914, from Spain, the exact locality being unknown. Many short recoveries also have been secured.

A Kite (*Milvus milvus*) banded at Rossitten, on July 3, 1909, was taken in July, 1912, at Dubenalken, Courland, and an Eagle (*Aquila pomarina*) banded about July 31, 1911, at Mitau, Courland was taken near Sofia, Bulgaria on September 28, 1911.

Miscellaneous Birds.

In addition to the cases above summarized, Thienemann has obtained many returns from Crows (*Corvus cornix*), banded at Rossitten and distributed along the coast of the Baltic Sea to a point north of Petrograd and west to the base of the peninsula of Jutland. From there, banded birds apparently kept more to the interior as there are no returns from coastal points on the North Sea, although recoveries have been obtained in the interior from areas almost as far west as the longitude of Paris.

Terns (*Sterna hirundo*, *S. sandvicensis*, *S. cantiaca*, and *S. fluviatilis*) banded in England and Holland, have been recovered from France (Brittany and Gironde), Germany, Denmark, Spain, Portugal, and southwest Africa. Of these, *S. cantiaca* has made the longest flights as one bird bearing a band from the Leyden Museum was taken near Quittah on the Gold Coast and two others, also with Leyden Museum bands, were taken on the coast of Angola. A specimen of *S. sandvicensis* marked at one of the Faroe Islands, with a British Birds band, was secured from the Ivory Coast province of French West Africa.

Cormorants (*Phalacrocorax carbo*) banded in England have

been recovered in France, Spain, and Portugal, and a Spoonbill (*Platalea leucorodia*) banded in Holland, was recaptured at Corvo, one of the Azores.

Among the shorebirds and smaller perching species there is available a limited number of returns, the largest number coming from the investigations conducted under the direction of British Birds Magazine and Aberdeen University, although the Hungarian Central Bureau for Ornithology and the German Ornithological Society also have obtained a certain amount of data pertaining to these groups.

Witherby (1917 and 1920) and Thomson (1921) have presented brief summaries of the information at hand for many of these species, but in no case are data sufficient to warrant any definite conclusions. It would appear that most of these birds (usually banded as fledglings or as breeding adults) are either sedentary or else they perform migrations of very limited extent, Ireland seeming to be favorite winter quarters for such species as the Curlew, Lapwing, Woodcock, and Snipe. The advantages of Ireland for avian winter quarters were, it will be recalled, pointed out under the discussion of the Teal. In the cases of the Lapwing and Woodcock there are returns also from France, Spain, and Portugal.

With the exception of two scattering records (one from Holland and one from the southwest of France) the Redbreast (*Erithacus r. melophilus*) shows no movement, many returns coming from the exact locality where the birds were banded. This applies also to many other passerine species.

Such returns from British marked birds as have been received from the continent, are mostly from France, Spain, and Portugal, particularly the two latter countries, indicating that there is a regular flyway for many species across the narrowest part of the English Channel.

In Hungary and Scotland the Blue Titmouse (*Parus caeruleus*) has yielded interesting data through trapping activities, 70 returns from 653 banded birds, being obtained in Scotland, one bird being recovered eleven times, while at a station in Hungary a specimen was recaptured every season for a period of five years.

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THE GRAY-HOODED QUAIL DOVE (GALLICOLUMBA RUBESCENS) OF THE MARQUESAS ISLANDS, IN CAPTIVITY.

BY E. W. GIFFORD.

Plate XIX.

DR. ROBERT CUSHMAN MURPHY has recently published a description[1] of *Gallicolumba rubescens* which hitherto has been known to science only from Krusenstern's plate published in 1814.

In January, 1923, I received thirty-one of these birds from Mr. R. H. Beck. As they had been in a traveling cage for three months they were in an exceedingly dirty condition. I immediately turned them into a sunny outdoor aviary at my home in Oakland, California, where they rapidly regained their normal cleanliness. The backs and heads of many which had been partially denuded of feathers in the perpetual squabbling for weeks in the cage were soon again copiously clothed in feathers. Their natural pugnacity continued to be manifested, however, after they were placed in my aviaries. The same quarrelsome disposition manifests itself in their offspring.

Although sparring with the wings is frequent where a number of Gray-hooded Quail Doves are together no physical harm results, unless a single bird becomes the object of the attacks of many. This has rarely happened in my flock. When it has, the victim of such continual persecution has always been given more congenial companions in another aviary. Often the pugnacity of the attacker evaporates if the attacked bird stands its ground. At times a

[1] Birds collected during the Whitney South Sea Expedition. I., American Museum Novitates, no. 115, pp. 10, 11, May 29, 1924.

third bird enters into a contest in which two are already engaged. Usually one of the original pair drops out so that the fight does not long remain three-cornered. Bluffing rather than fighting is the better way to characterize their combats. Hens seem very nearly as pugnacious as cocks, and I have seen them attack males.

Two birds feeding close together suddenly conceive a violent antipathy for one another. They pick at the ground, or at seed, very vigorously for a few seconds like a couple of fighting cocks, at the same time sidling up to one another. Then up goes the outside wing of each in a defensive posture. At the same instant one strikes the other a sharp blow with the inside wing. I speak of inside and outside wings because usually their sparring position is side to side, not face to face. Such contests last perhaps a minute or two, during which time there is more or less retreat and advance on the part of each combatant. Suddenly both lose interest in the match and resume their feeding, or one acknowledges himself defeated and scurries for cover or vents his spite on a bystander. The victor walks about for perhaps half a minute waving his wings in a blustery fashion and apparently seeking a new fight.

Feathers are seldom lost in such an encounter. They usually are pulled out in surprise attacks when an unwary bird is pounced upon by a treacherous neighbor without warning. Then neck or back feathers are seized by the attacker. The forward movement of the victim leaves the feathers in the mouth of the assailant. Then follows a fencing combat with the wings as described above.

Young birds in juvenal plumage are not attacked. An adult male sometimes rushes at one, which usually cowers and raises one or both wings high above its back. The apparently meditated attack is transformed into a half minute of very rough fondling on the part of the adult, who will vigorously run his bill in among the neck and back feathers of the squab, much as he would caress a female. The squab generally squirms and tries to escape this treatment.

When rushing to an attack, and after a fight, the wings are carried loose and drooping at the sides. In the former case the feathers along the middle of the back are slightly raised, though not to such an extent as in *Gallicolumba jobiensis*, in which they appear as a distinct ridge when elevated during a sparring contest.

Gray-hooded Quail Doves will battle as readily with the larger *Gallicolumba jobiensis* and *xanthonura* as with individuals of their own species, often putting the larger birds to flight. For the still larger *Gallicolumba stairi* on its own ground they have a wholesome respect; though if one of these intrudes upon their premises one or more will attack and drive out the trespasser. With *Gallicolumba luzonica* they seem not to quarrel. Perhaps the nervous, restless temperament of this species, which manifests itself in incessant, aimless walking, and its utter disregard of the smaller *rubescens* make it an uninteresting opponent for the fight-loving Marquesans.

Gallicolumba rubescens does not walk in the tippeting fashion of its relative *Gallicolumba luzonica*, the famous Bleeding-heart Dove. Neither does it have the peculiar display habit manifested by that species of leaning back and protruding the crop region, which in *G. luzonica* is colored a deep carmine.

Normally in walking *rubescens* carries its tail below its wing tips. Now and then an individual may walk with it above them and distinctly elevated so that the bird has somewhat the appearance of a small chicken. This type of tail carriage is frequent with *jobiensis* and particularly marked in *stairi*.

The Gray-hooded Quail Dove is the most active Dove with which I am acquainted. The hours of meditative perching which characterize other Doves are not true of this species. Individuals, if not incubating eggs, are continually up and doing during the day. Feeding at the regular feeding place, digging out choice tidbits in soil against walls and fences, examining the tidbits found by others, sunbathing, courting, paying addresses to a neighbor's wife, nest building, and investigating a neighbor's nesting arrangements (only to be promptly driven out) constitute the bulk of the daily activities of these energetic birds. Their energy appears usually to be directed toward an end and is not expended in futile and apparently aimless pedestrian activities as it is with *Gallicolumba luzonica*.

Gray-hooded Quail Doves impress me as having something ralline and galline in their actions on the ground, where they spend most of their time.. Their interest in digging and turning over loose soil, leaves, and rubbish is never satiated. The result is a series of small holes all along the aviary walls having an

appearance at times alarmingly like rat and mouse holes, for often the excavation is not a mere depression in the surface but a small cavity made under a clod of earth or a stone. At no time have I seen the feet used for scratching; the bill is the only digging instrument. This eternal digging makes this species a bad one to keep with ground nesting doves like *Geophaps* and *Lophophaps*, as their nests are destroyed and their eggs rolled out of place or broken.

Although the plumage pattern of the Gray-hooded Quail Dove is harmonious and a fresh plumaged male is indeed a thing of beauty, the appearance of the birds on foot is much of the time slovenly, for the wings are often carried drooping. The result is that the characteristic white wing band is more or less displayed even when on foot. On the other hand if a person attempts to capture one of these birds the wings are drawn up and the appearance becomes much more graceful and sleek as the bird holds itself in readiness to escape human pursuit. The flight then is swifter than ordinarily. The ordinary flight of the species from perch to perch is slow and weak. The broad white wing band and the white base of the tail show very conspicuously when the bird is on the wing.

When held in the hand this species has the curious habit of repeatedly gaping in a fashion that leads one to think that it is about to expire.

No attempt to decoy a human intruder from a nest has been observed, but what appears rather to be a threat against the intruder has been noted, the male walking toward the intruder with wings half spread as when fighting another bird.

Sun-bathing is a favorite pastime; the hotter the day the more it is relished. The bird reclines on its side on one wing which is folded and either stretches the other downward so as to let the sun play on the exterior surface fully, or stretches it upward to allow the sun to play on its interior surface and the side of the body. After a few minutes the other wing is extended in like fashion. The body feathers are elevated to allow penetration of the rays to the skin. Not infrequently a bird sunning the under wing surface rolls over on its side so far that it requires a quick closing of the wing to keep from losing its balance and rolling on to its back.

Bathing in a pool of water is never indulged in, but a shower bath in the rain or from a garden hose is a source of endless delight. No matter how cold the weather the appearance of fine spray from a hose brings a complete cessation of all activities and an immediate assemblage in the spray and enjoyment of the bath. Nesting birds, however, resist the temptation and do not leave their charges. Each bird lies on its side and extends one wing upward so that the spray falls on the inner surface of the wing and against the body, the feathers of which are elevated to allow penetration of the spray to the skin. When the water is shut off a number usually linger in a reclining position in the hope of receiving more or catching stray drops that fall from the wire. Reluctantly they rise, shake themselves, and perhaps indulge in a bit of preening.

Within two months after receiving the Gray-hooded Quail Doves a pair nested and within four months four pairs were nesting. As I use fiber bowls as nests, in which the birds deposit twigs and stems, it is impossible to describe the true nest of the species. Judging from the handful of material deposit in each bowl, the nest in their native habitat is probably of the usual poor construction that characterizes Dove nests in general. The male gathers the nesting material and carries it to the waiting female at the nest site. Twigs are sometimes added haphazardly by the male for a day or two after the eggs are laid.

Nesting is preceded by display on the part of the male, and treading. After some fondling in the way of running their bills among each other's neck and back feathers, the female thrusts her bill in the male's mouth in customary pigeon style. This may be done three or four times before treading takes place or may not actually be succeeded by treading. Between the billing operations both cock and hen parade back and forth to their respective ends of the perch, the male resplendent in his sleek plumage which then shows to best advantage. There is no spreading of the wing or tail for display as with the Bronze-winged Doves, but the plumage of the neck is somewhat distended as in Domestic Pigeons. The actual billing is usually preceded by a bit of preening of back feathers on the part of each bird.

Eggs are two in number and white. The male incubates them

from about 9 A. M. to 4 P. M., the female the remainder of the twenty-four hours. Droppings of females made when they leave the nest in the morning are exceedingly large, indicating that they have been held unduly. The nest is never dirtied by either male or female. Sometimes both birds sit together on the eggs or squabs. Incubation lasts fourteen days, perhaps thirteen or fifteen in some cases. As the eggs are laid at least twenty-four hours apart, the hatching of the two squabs is separated by a like interval. As a result of this, perhaps, there is a considerable disparity in the size of the squabs as they develop. Unhappily the smaller one at times succumbs while in the nest. At the end of a week, when the squabs have become partially fledged, their parents begin to leave them uncovered for intervals, which as the days pass grow longer until time to leave the nest arrives. On the nest the Gray-hooded Quail Doves are fearless and will allow a person to thrust his face within a foot of the nest without leaving. Handling, however, puts them to flight. No attempt is made to buffet the investigator with the wings.

Usually thirteen or fourteen days elapse before the squabs leave the nest for the ground. At night they do not attempt to perch but huddle together in a corner. In this respect they differ from *Gallicolumba xanthonura*, the young of which take to perching immediately upon leaving the nest and appear much more capable of caring for themselves than the young *Gallicolumba rubescens*. The squabs have a high-pitched squeaky call when begging to be fed. Feeding is in the usual Dove fashion, by regurgitation. Often when being so fed one wing of the squab is placed over the parent's back. Feeding of squabs on the ground is preceded by much importunity on their part and more or less hesitancy about settling to the task on the part of the parent, which is apparently ready for the feeding operation but cannot bring itself to begin except after a bit of pacing back and forth in front of the squealing squab, which seeks as best it can to follow its parent's movements. Squabs shake their wings when importuning their parents for food. Although I do not know definitely, I should say that the squab begins to pick up food for itself before the end of a week after it has left the nest, but feeding by the parents may continue for half a week or even a week longer.

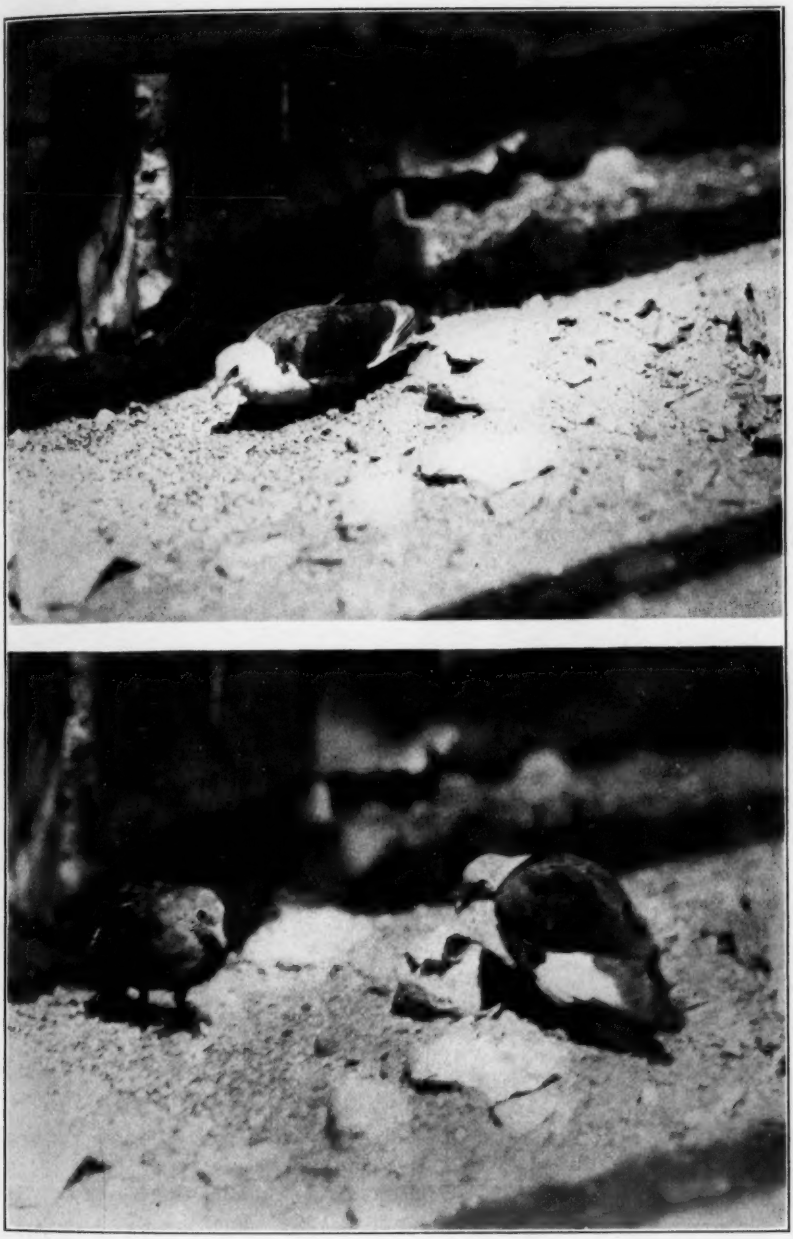
Before the squabs are out of the nest a new nest with eggs is usually being cared for by both parents. Apparently there is no neglect of the squabs in the first nest. In 1923 four and five clutches of eggs were laid by each of three of my breeding pairs, although by no means was I successful in rearing young from all of the eggs.

Breeding maturity is attained quickly by the young. A female hatched in April, 1923, was mated and laid eggs in October. Our winter appears to be their natural nesting season, and it is found necessary to separate the cocks and hens at that time as the young hatched do not survive the cold weather once their parents start leaving them alone in the nest for intervals.

During the winter of 1923–1924 the birds continued nesting, and probably as a result failed to nest during the spring and summer of 1924. In autumn 1924, nesting was resumed, but the birds were not allowed to nest in the winter because of the failure to rear squabs in cold weather. Now (March 1925), the males and females having been again put together, nesting has been resumed. It appears that our winter months may correspond with the nesting season in the Marquesas. The birds were in a traveling cage in the winter of 1922–1923 and could not breed at that time. Upon recovery from the effects of travel and denudation they nested from spring to winter in 1923, but rested from nesting in the spring and summer of 1924. The nesting resumed in the fall of 1924, would probably have continued through the winter of 1924–1925 if the males and females had not been separated. Separation of males and females during the winter when they desire to nest seems therefore to merely defer the breeding season rather than to cause it to be completely omitted.

The coo of the Gray-hooded Quail Dove is a peculiar, un-dove-like, rasping, snarling sound best characterized as a bark. It is given very infrequently, and then either in paying addresses to the female or to another male. With the shortage of females in my flock, I found males consorting and playing at nesting. Females coo, but apparently rarely.

The birds in my aviaries are fed hemp, yellow millet, paddy rice, canary seed, and white Egyptian corn, upon which they thrive. Meal worms are devoured with avidity, as they are also by *G.*



1. MALE GALLICOLUMBA RUBESCENS FEEDING.
2. MALE AND FEMALE ABOUT TO DISPUTE FEEDING RIGHTS; WING SPREAD PREPARATORY TO SPARRING.

luzonica. Seeds still attached to grass stalks are eaten. They reach or jump for leaning dry grass stalks, pull these to the ground with the bill, place one foot on the stem just below the head to hold it firmly, then proceed to pull the head to pieces in search of seeds. I one day saw a male jumping for a grass stem from the top of a low stone. He missed and fell to the ground after which he ceased his attempts for that particular stem.

Another interesting bit of behavior was noted. Now and then a bird gets a thread or other fibrous material entangled about its toes. Instead of struggling along as best it can without any effort to release itself as many Doves do, the Marquesan Dove pauses quietly and proceeds to minutely inspect its toes and if possible to pull off the thread with its bill.

Curiosity is strong in this species. A strange object, or someone sitting in or near the aviary, draws one or more inquisitive individuals into close range (within a yard), where with craned necks they eye the intruder for a half minute or so and then resume their normal activities.

Gray-hooded Quail Doves retire to their perches promptly as night settles and engage in none of the crepuscular roaming and feeding that characterizes Bronze-winged Doves (*Phaps chalcoptera*).

As with most doves and pigeons the Gray-hooded Quail Dove of the Marquesas takes kindly to captivity. There is perhaps no better proof of this than their readiness to breed. It is axiomatic that a nesting bird is a happy bird.

Without the intervention of the aviculturist and the perpetuation of the various species of *Gallicolumba* in aviaries it is obvious that a number of beautiful species of these essentially terrestrial birds are doomed to extinction in the near future by cats introduced into their native islands. For example: in the Tonga Group the indigenous species, *Gallicolumba stairi*, once widespread, is now limited to two or three outlying uninhabited islands. Let some thoughtless native leave a cat or two there when on a copra-gathering expedition and the species will shortly be extinct. The very bird we have been dealing with has become extinct on Nukuhiva Island, Marquesas Group, since Krusenstern's day, through the introduction of cats. Today it survives only on two small outlying islands.

The zoological gardens and private aviculturists can confer a great boon upon all bird lovers by perpetuating through breeding in captivity the various beautiful species of Quail Doves of the Oceanic genus *Gallicolumba*.

Exactly the same situation obtains in the great insular region of the New World, the West Indies, as in Oceania. The mongoose and the cat are fast making extinct the beautiful Quail Doves of the genera *Oreopeleia*, *Starnoenas*, and *Geotrygon*, all of which are terrestrial in habits. Only the zoological garden and the aviarist can save these beautiful species for posterity by breeding them in confinement where they are protected from the natural enemies introduced by modern man.

Examples of the Gray-hooded Quail Dove, the subject of this brief paper, may be seen in the zoological parks at New York, Washington, Milwaukee, and London.

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NOTES ON THE BREEDING HABITS OF SOME GEORGIA BIRDS.

BY THOS. D. BURLEIGH.

Blue Jay (*Cyanocitta cristata, sub-species?*).

To one unfamiliar with southern bird life the habits of the Blue Jay, in Georgia at least, come as a distinct surprise. In the North it is a bird of the woods, with a natural curiosity in the ways of man but suspicious of any intimacy and during the breeding season shunning civilization as much as possible. In the South, however, it has apparently lost this shyness and is as much a bird of the towns and even cities as is the English Sparrow. In Athens, which lies in the northeastern corner of the State, the birds are common throughout the town, not only in the residential section but even in the business district, and as this town has a population of about 20,000, with street cars, several "skyscrapers" and other modern improvements, the confidence of these birds in man is easily realized. In many ways they replace the Robin which is

of course lacking here during the summer months, and this impression is strengthened by their breeding habits. Like the Robin they nest early before the trees are in leaf and as there is little opportunity for concealment the nests are generally placed in crotches of the larger trees where they are easily seen but by no means conspicuous. Many of the streets of Athens are lined with large trees, the commonest being possibly the water oak (*Quercus nigra*), and it is in these that the nests can usually be found. There are several good sized cottonwoods in the front yard of the house adjoining that in which I live and each year a pair of these birds build here and successfully rear their young. A nest which shows very well the lack of fear these birds possess is one I found this past spring. It was fifteen feet from the ground in a crotch of one of the limbs of a large water oak at the corner of two of the principal streets of the town, on one of which a street car ran at frequent intervals, and almost beneath an arc light. This was early in April when the tree was still practically bare and the nest easily seen. In structure the nests vary little, being built of twigs, rootlets, weed stems, dead leaves, bits of paper and mud, lined well with fine rootlets. Two broods are seemingly raised each year for fresh sets can be found early in April and again the latter part of May. My earliest breeding record is a nest found April 2, 1923, that held six slightly incubated eggs, my latest a nest that held three fresh eggs June 5, 1923. From three years' experience I consider from the 12th to the 15th of April the average date when fresh sets can first be found.

Florida Grackle (*Quiscalus quiscula aglaeus*).

The breeding range of this species in Georgia is rather limited for it apparently is confined at present to the extreme southern counties that border the Florida line. My personal experience has been largely about Waycross, in Ware County, and it was in the Okefenokee Swamp, some forty or so miles southeast of this city that I really came to have more than a passing acquaintance with these birds. The Okefenokee Swamp was at one time almost impenetrable, and little known except to a few venturesome settlers that lived on the larger islands, but a logging company began cutting out the cypress and changed things quite radically. Among

other things they ran their narrow guage railroad to Billy's Island, approximately twenty miles into the interior of the Swamp, and established a permanent camp there, making access to the Swamp easy and comparatively safe. Billy's Island itself is merely a bit of solid land in the middle of seemingly endless miles of swamp, and is characterized, as are the other scattered islands, by what was once a fine virgin stand of longleaf pine (*Pinus palustris*). These have of recent years been badly turpentined, and many have been cut for fuel wood, but possibly two-thirds of them remain and form a small stretch of open woods about the logging camp. It is here that a small colony of Florida Grackles nest each year, and here I had a brief but intimate glimpse of their home life. There were possibly a dozen pair on the Island, and I was interested to see that they showed a decided preference for the trees at the very edge of the camp. Trees equally good for this purpose covered the larger part of the island, and the birds could have had real privacy in some of the more remote corners, but one and all preferred to nest as close as possible to the houses. The trees averaged two feet in diameter, with no limbs for thirty or forty feet from the ground, so the risk they ran of being molested was after all rather slight. At the time of my visit this past spring, April 28, 1923, nesting was well under way and there was seemingly little difference in the actual day when each pair had begun to build. The nests, never more than one to a tree, ranged from twenty-five to fully a hundred feet from the ground, some of them being at the outer end of the upper branches where they were quite inaccessible. The average height was fifty feet, and they were usually in a crotch of one of the limbs eight or ten feet from the trunk. I managed to reach three of them, and found in two five eggs and in the third four, all of them half incubated. The nests proved very similar in construction, being well built of gray usnea moss intermixed with dry pine needles and grasses, coated on the inside with mud and then well lined with fine grasses. In each case the female was incubating but flushed quietly and showed practically no concern over the nest, disappearing and not being seen again. The males were seen at intervals during the day, flying by overhead or feeding in the swamp close by, but as a whole the colony was, at this time at least, a quiet and inconspicuous one.

Goldfinch (*Astragalinus tristis tristis*).

As a general rule where a species has a wide breeding range there is little actual difference in the manner in which it nests in widely separated localities. A Catbird in Pennsylvania or Ohio, or Montana, or a Cedar Waxwing in New York, or Washington, remains true to its inherited tendencies and nests as one familiar with its breeding habits would expect. The Goldfinch, however, seemingly prefers to be individual in this respect and in the Piedmont region of Georgia, the farthest south that it breeds in the East, it has departed quite radically from the habits of its Yankee brothers, and sisters, farther north. Such at least has been my experience about Athens. Here the original forest was probably entirely coniferous, with the loblolly pine, (*Pinus taeda*), and the shortleaf pine, (*Pinus echinata*), covering large areas with practically pure stands. Gradually, with the encroachment of civilization, this virgin forest was cut out and replaced with scattered stands of mixed hardwoods, the pine timber remaining being largely second growth, even-aged, and in comparatively short stretches. Through this section the Goldfinch breeds in small numbers and while by no means common it can still be found during the summer months quite regularly in certain spots. I felt that I was reasonably familiar with its breeding habits and as the middle of July approached, during my first year in Georgia, I made an attempt to locate a nest, feeling confident that I would have little, difficulty in doing so. I made the error, however, of confining myself to the scattered stretches of hardwoods, spots such as, in Pennsylvania, these birds would unquestionably have chosen, and it was only by accident that I finally found my first nest. I was passing through a short stretch of open pine woods when a male Goldfinch flew by overhead, circled, calling and was answered almost immediately by another bird in a tree near me. A short search revealed the nest in a large shortleaf pine, sixty feet from the ground and six feet out at the outer end of one of the upper limbs. This was the 30th of July, 1921, and the nest on that date held five fresh eggs. It was typical of this species, being compactly built of weed stems, grasses, shreds of bark and numerous small dried flowers, well lined with thistle down, and covered somewhat on the outside with spiders' webs. It was not until

the following year that I was able to devote more time to these birds, but with this one experience as a clue to where and when to look I had little trouble in verifying the data already at hand. On the 31st of July, 1922, I found a nest that held four well incubated eggs that was thirty feet from the ground at the extreme outer end of a limb of a shortleaf pine at the edge of a short stretch of open pine woods. Like the last it was compactly built of weed stems, grasses, shreds of bark and plant down, deeply cupped and well lined with thistle down. Almost two months later, in another stretch of open pine woods, I found a nest that on the 23rd of September held either eggs or young, and was forty-five feet from the ground at the outer end of an upper limb of a shortleaf pine. Attracted by the very evident distress of both the birds I looked about for the cause and was just in time to see a Blue Jay fly from the nest to an adjoining tree and calmly wipe its bill. The nest proved to be empty, but it unquestionably had held either eggs or young earlier in the day and was probably the second brood of this pair of birds. This past summer, 1923, I was in Athens only for a few days during the middle of July, and, while the birds were again about the scattered stretches of pine woods where I had found them before, I was a little too early and did not succeed in finding a nest. Summed up briefly, the following facts seem to me to be worthy of emphasizing in so far as the breeding habits of these birds are concerned. First, they do not nest early as other birds do this far south but wait until the latter part of July or the first of August before rearing their young. Such species as the Field Sparrow and Brown Thrasher nest a month earlier than I found them to breed in Pennsylvania, but the Goldfinch appears unaffected by the early arrival of spring and the long stretch of warm weather. Second, hardwoods are consistently avoided and pines invariably selected as a suitable nesting site, in direct contradiction to the breeding habits of this species farther north. The birds are close associates of the Pine Warbler in this region, nesting much as these birds do both in so far as they are confined to the pine woods and also in that they nest high and well out toward the ends of the branches. This latter fact is also at variance with their usual habits for in Pennsylvania I have very frequently found nests in red maple or chestnut saplings within eight or ten

feet from the ground. All in all these birds are individual enough to be well worth a little study, and I personally have been much interested in watching them through the summer months.

State Agricultural College, Athens, Ga.

A FOSSIL BIRD'S EGG FROM THE POST-TERTIARY MUD-ROCKS OF FIJI.

BY CASEY A. WOOD,

Plate XX.

IN September, 1923, while examining an extensive collection of Polynesian curios and antiquities made during the previous 40 years by the Hon. Mr. Turner[1] of Suva, Fiji, the writer discovered a well-preserved fossil egg (or, as he prefers to call such a specimen, a partially petrified egg shell) that had been dug out of the Suvan "soapstone." During an excavation made less than 200 yards from the seashore and about a mile and a half from the town, the workmen came upon a number of fossilized objects, among them, fifteen feet below the surface, the egg in question. It was a very good example of a fossilized egg, the shell being intact except at two or three small, scattered points and at one more extensive patch close to the larger rounded end. The color was a dirty gray, sparingly spotted with reddish-brown. The shell was quite free of dried earth or mud, although it had evidently not been cleaned. Both the naked eye and lens examination (through the cracks and defects in the outer covering) showed that the solid contents filled the shell completely, and were identical in appearance with and of similar structure to the friable rock by which it was originally surrounded.

The egg measured 1.90 × 1.45 in. The photographs give a good idea of its external aspects. Like the age of the fossil, its specific character is quite speculative, except that it is *probably* (in view of its size, coloring and proximity to the ocean) the egg of a water

[1] This gentleman has since donated his collection to the Museum of the City of Auckland, New Zealand, his native town.

bird. The present writer would be greatly in debt to the geologist or oölogist who will throw some light on these mysteries.

Something further will be said about the antiseptic, volcanic mass in which this fossil egg shell was preserved through the centuries as it seems an ideal embalming agent for the indefinite preservation of avian egg shells. Meantime it does not require much exercise of the scientific imagination to conceive a rivulet of partially cooled mud slowly finding its way into the Tertiary ocean upon whose shore a waterfowl had made her nest. An egg is soon buried in the mobile mass and (it maybe) covered by successive waves of hot, semi-fluid detritus. Ere long the contents of the egg soak through the cracks in the shell and are lost in the surrounding sediment, and eventually their place is taken by the soapy debris. In the course of time, the air excluded and putrefaction lacking, the egg and its now foreign contents are embalmed, dried and consolidated into the form discovered by modern man.

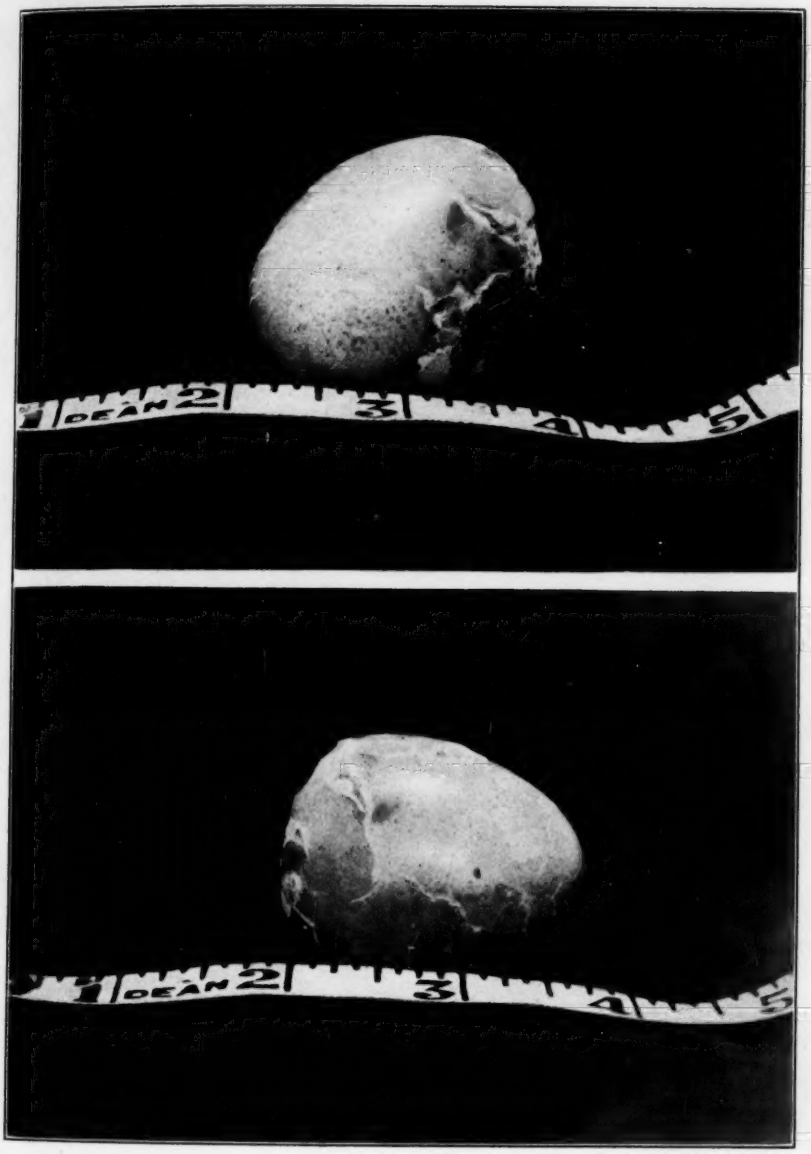
The writer had an excellent opportunity of studying this subject in connection with his observations on the 'Fossil Eggs of Bermudan Birds from the Paget Limestone' (*Ibis*, Vol. V, No. 2, April, 1923, p. 191); and to that illustrated article he would refer the interested reader. It may, however, be here repeated that fossil egg shells are much rarer than other avian fossils. Of these, struthious eggs (from the Australian region) are more common and better known than carinate specimens. The only fossil eggs of Nearctic origin fully described in literature were found in South Dakota and Bermuda.

As pointed out, there are numerous difficulties in identifying a fossil bird's egg, among them the chance that it may be of reptilian (especially of lacertilian or chelonian) origin.

As previously suggested, it is probably only the shell, with its external layer and lining membrane, that undergoes a process of fossilization (one might call it *heterocalcification*), the emptied shell being afterwards filled with mud, comminuted rock or sand of the same quality in which it was imbedded.

It is only when the egg contains bones or immature feathers that a genuine fossilization occurs—such as one finds in the more common forms of body petrifaction.

In deciding the class or genus to which may be referred a given



FOSSIL EGG FROM THE FIJIAN POST-TERTIARY MUDSTONES (CASEY WOOD).

petrified egg the microscope is to some extent an aid; and, as fossil eggs generally retain their original shape and most of their external markings, the usual measurements and color indications are useful guides.

The preserving medium that so thoroughly embalmed the Fijian bird's egg deserves more than a passing mention. N. D. Cochrane (Report on the Rocks of Vitilevu and Vaualevu, *Council Paper* No. 15, Fiji, pp. 2 and 16) well describes these sedimentary mudstones of the larger islands, and refers to their modifications in various localities.

For example, in Bau, the ancient capital, he noticed a fine, greenish mudstone which the writer has observed not only on that island but elsewhere. In exploring many parts of the country after a recent rain, the slippery, soapy character of this volcanic deposit is emphatically in evidence. It is then with the greatest difficulty that one is able to climb the hills or even to follow the natives through the jungle.

They had the great advantage of being able to go about in their bare feet, and to dig their functionating toes into the semisolid, greasy soapstone and so to push and pull themselves along, while the Europeans of the party had to drag themselves over the treacherous trail without much help from their boots or rubber shoes.

Cochrane says of the Bau mudstone that in its dried, stratified form it readily splits up into pieces two or three yards long by two or three feet wide and a few inches thick, but is not sufficiently solid to use as flagstones. It contains glauconite material, and also shows remains of formanifera. He remarks further that in Vitilevu the mudstones are locally known as "soapstones," from their fine, slippery character, but at times the material has been coarser, when the beds become more of the nature of sandstones. These strata have been mostly derived from the volcanic output, more especially from the ash, and at times no doubt they and the tuffs are the equivalent of each other at the submarine and leeward positions of the same bed. They form extensive and usually only slightly inclined strata along most of the coastal plains, extending at low levels as far inland as Serea on the Rewa and Waisa on the Sigatoka rivers. Cochrane believes that a great

elevation of the larger islands, especially of Vitilevu, occurred during tertiary time.

The labor of excavating these sedimentary deposits, both stratified and other, is by no means difficult, and rarely calls for any tools except pickax and shovel. It was by these simple means that the present fossil was unearthed.

From the same excavation were taken a number of other organized petrefactions—shells of mollusks, leaves, small cocoanuts, branches of trees, etc., evidently fallen into the fresh volcanic stream of soft mud, beneath which they sank, perhaps to be still more deeply buried by further waves of hot, semi-liquid material. It was an ideal preservative—this aseptic, pultaceous, marly mudstone, and in that particular reminds one of the tarry lakelets that engulfed and preserved through geologic ages the wild life of the Los Angeles asphalts. In any event, all the resurrected remains found in the Suvan soapstones had preserved their external markings despite the many eons they had lain in their rocky bed.

In this connection, H. B. Brady (*Quarterly Journ. Geolog. Soc.*, Vol. XLIV, 1888) believes that the volcanic mud-rocks of Vitilevu are undoubtedly of post-tertiary origin. Samples of Suva soapstone examined by him were found to contain 5 to 6 per cent of lime and displayed shells of pteropods and other mollusks, formainifera, etc., in deposits of different heights up to 100 feet above sea level. All but five species of the foraminifera are known to be now living in the Pacific.

Kandy, Ceylon.

BIRDS OF BARDSTOWN, NELSON COUNTY, KENTUCKY.

BY BENEDICT J. BLINCOE.

DURING the ten years from 1911 to 1921, I identified one hundred and fifty-seven bird species in the vicinity of Bardstown, Nelson County, Kentucky. About thirty years before my observations commenced, Charles Wickliffe Beckham collected and observed at Bardstown, and in 1885, his 'List of Birds of Nelson County,' comprising one hundred and seventy-one species, was published by the Kentucky Geological Survey, his studies covering a period

of five or six years subsequent to 1877. It is not to be expected that the bird life of a third of a century ago would remain constant when such great changes, brought on by the advances of civilization, have come over the country, destroying the natural haunts of many birds, and at the same time opening the way for others. Therefore, in the preparation of this paper the fundamental motive has been toward comparison with rather than criticism of Beckham's records.

Bardstown lies about six hundred and thirty-five feet above sea-level and is situated near the center of Nelson County about thirty-nine miles southeast of the city of Louisville. Nelson County is on the western rim of the famed "Blue Grass Region;" about one-half its area, mainly north and east of Bardstown, is gently rolling, well cleared, productive land that is typically "Blue Grass" in appearance. To the south and west, approaching within five or six miles of Bardstown, there extends across the country a range of conical hills which appear almost mountainous against the horizon, and are spoken of throughout Kentucky as "The Knobs." Less productive than the northern and eastern sections of the county, the "knob" region is considerably more wooded, but everywhere the big timber has been cut. In the immediate vicinity of Bardstown thickets of small area individually are numerous. Several varieties of oak, white ash, sugar maple, white and red elm, tulip tree, wild black cherry, black walnut, pig hickory, hackberry, redbud, mulberry, sassafras and persimmon are among the more common deciduous trees of general distribution. The beech is quite common in some places and the sweet gum occurs in the "knobs." Sycamores and willows are abundant along the streams. The red cedar is one of the predominating trees, often forming pure stands in small thickets, particularly on the thin soil of rocky ridges or hillsides. The scrub pine is rather common in some sections, mainly in the hills.

As Beckham remarks in his report, water birds are not numerous as there is but little to attract them. The Beech Fork River crosses the county near the center flowing through a rather narrow valley in which the formation of extensive sloughs has been impossible. There are no swamps or natural lakes and artificial ponds are few; consequently the scarcity of water birds is largely due to the lack of their natural element, water.

As an amateur bird student my field study was done mainly on Sundays and at odd times during slack seasons on the farm on which I lived. While the country near my home was more thoroughly worked over, frequent short trips were made in several other localities in the county. I collected or examined in hand one hundred and fifteen species mentioned in the list. My observations were suspended from May 1, 1918, to June 21, 1919, during which time I was in the U. S. Army, otherwise they were continuous from the summer of 1911 to September 1, 1921. As far as possible I kept record of all species seen each day, while at my work as well as on field trips; thus I was able to keep in close touch with the birds and their movements, and to note many incidents that would not have come to my attention had I not lived on a farm. Several species have been omitted from the list because I was not fully satisfied as to their identity.

Some remarks regarding the arrangement of the list, also concerning the annotations which follow each species, will be essential to a clear understanding of the whole. As two species of recent introduction had not become established as a part of the local avifauna, they were not included in the main list; also, there is appended a list of twenty-nine species that are included in Beckham's list, but my observation and inquiry failed to verify their occurrence during my period of activity. A single asterisk follows the names of twelve birds indicating that Beckham found them breeding although my observations yielded no direct evidence that they did so. A double asterisk marks sixty-two species found breeding both by Beckham and myself. A triple asterisk occurs only six times and refers to species which I found breeding, but were not found breeding by Beckham. In view of the scarcity of Beckham's list I have cited his general statement for most species; wherever I have made no comment on the quotation my observation corresponds with the statement cited.

To the following gentlemen I wish to acknowledge my thanks for various courtesies that have greatly aided me in the study of the bird life of the Bardstown region: Mr. Albert F. Ganier, President of the Tennessee Ornithological Society, Nashville, Tennessee; Dr. R. S. Tuttle, former Exec. Agent of the Kentucky Game and Fish Commission; Messrs. Harold Hurst and Thomas

Stocker, business men and enthusiastic sportsmen of Bardstown; and my brother R. A. Blincoe. Also, from the late Monroe Hurst of Bardstown, I received much valuable information regarding water-fowl. Mr. Hurst gave me accurate descriptions of American Merganser, Baldpate, and Pintail, but I have not included these in the list as they were not seen personally, and in the preparation of this list I have adhered strictly to the rule of including only species for which I could personally vouch. Such action, from a scientific standpoint, is necessary to avoid error, and while I have every confidence in Mr. Hurst's record of these three Ducks in Nelson County, it is with regret that I am forced to omit them from the list.

Gavia immer. LOON.—Not recorded by Beckham. A specimen taken at Nazareth Academy, near Bardstown, and preserved in the museum there. Reported by hunters but in most cases these reports were not trustworthy.

Larus argentatus. HERRING GULL.—Not recorded by Beckham. One specimen shot by a hunter, January 21, 1916, along the Beech Fork River, and brought to me for mounting.

Phalacrocorax auritus. DOUBLE-CRESTED CORMORANT.—Not recorded by Beckham. One record; an immature bird shot from a flock of seven on September 30, 1916, by a local hunter. I am unable to state to which geographic race this specimen is referable.

Lophodytes cucullatus. HOODED MERGANSER.—Not recorded by Beckham. One record; a mounted specimen, taken by a local hunter, the date unknown.

Anas platyrhynchos. MALLARD.—"Transient; common." (Beck.) Numerous February 24, 1918, and frequently seen on other ocasions during the migrations. Duck hunters report it as common.

Anas rubripes tristis. BLACK DUCK.—Not recorded by Beckham. Frequently taken by Duck hunters. A specimen taken by the late Monroe Hurst of Bardstown, November 20, 1917.

Aix sponsa. WOOD DUCK.*—"An uncommon summer resident." (B.) In July, 1920, I saw two Ducks believed to have been of this species in a rather secluded place along the Beech Fork River several miles southwest of Bardstown. I saw a pair that were taken in October, 1917, and it was reported in April, 1918.

Branta canadensis canadensis. CANADA GOOSE.—"Rather common in the air; but very few are seen on terra firma in these parts." (B.) A flock of eight Geese seen on January 31, 1921, were believed to have been of this species. A flock seen at close range in the month of February a few years previous to 1912.

Botaurus lentiginosus. AMERICAN BITTERN. —"Transient; rather

uncommon." (B.) I have three records, all of specimens taken; March 27, 1916; April 13, 1916; and November 22, 1917.

Ardea herodias herodias. GREAT BLUE HERON.—"Rather uncommon." (B.) Frequently common along the Beech Fork in summer. I could get no information as to this bird nesting, and never saw any in the breeding plumage. April 8–September.

Butorides virescens virescens. GREEN HERON.**—"A common summer resident." (B.) Very common. April 25–September 23.

Porzana carolina. SORA RAIL.—"Transient; rather common in October." (B.) I have but one record; an immature bird captured alive during the last week of August, 1913, and brought to me several days after it was caught.

Fulica americana. COOT.—"Transient, rather uncommon." (B.) From observation and reports it is of frequent occurrence as a migrant. Specimens: April 5, 1916; April 10, 1916; September 23, 1916. In October, 1916, one was captured under the floor of a deserted cabin on a hillside. In the spring of 1919 one was caught in the hen house at my home during my absence; the identity of this specimen being ascertained by my brother, R. A. Blincoe.

Ribicola minor. WOODCOCK.—"Transient, so far as I know, but a few probably breed here. Not very common." (B.) I saw a single bird on July 18, and 21, 1921, on the river bank ten miles south-west of Bardstown. Specimens brought to me; November 15, 1915; and November 18, 1919. Reported as seen September 18, 1916.

Gallinago delicata. WILSON'S SNIPE.—"Transient. Abundant in March and the first part of April." (B.) Generally quite common in spring, and fairly so in the fall. February 18–April 13. November 10–December 28. No January records.

Tringa solitaria solitaria. SOLITARY SANDPIPER.—"Transient. Quite common in spring." (B.) One seen September 19, 1919, and a single bird seen on several occasions between April 24, and May 7, 1920, are all that were positively identified.

Actitis macularia. SPOTTED SANDPIPER.—"Transient." (B.) Common in May, July and August. It is my opinion that it breeds rarely, as it is rarely seen throughout the summer along the Beech Fork. Beckham remarks that it arrives "April 5 to 10," but I never saw it until a month later. May 14–September 21.

Oxyechus vociferus. KILLDEER.**—"A permanent resident." (B.) Commonly breeding but more numerous in the migrations, and often scarce or absent in mid-winter.

Colinus virginianus virginianus. BOBWHITE.**—"A common permanent resident." (B.) Common, but not as numerous in 1920 as ten years previously.

Bonasa umbellus umbellus. RUFFED GROUSE.*—"Permanent resident." (B.) Specimens identified that were taken by hunters in November, 1915, and 1916. Frequently reported from the Knobs in

western and southern portions of the county. Probably a rare breeder in those sections. Local name, "Pheasant."

Zenaidura macroura carolinensis. MOURNING DOVE.**—"A common permanent resident." (B.) Sometimes quite scarce in winter.

Cathartes aura septentrionalis. TURKEY VULTURE.**—"A common permanent resident." (B.) Usually absent in mid-winter. Not as abundant in 1920 as ten years previously, though still common.

Coragyps urubu. BLACK VULTURE.***—"An uncommon summer resident." (B.) I saw it in every month; often occurring in winter when the common species was absent. Generally not nearly as numerous as the last. An unusual flight appeared in March 1921. ('Auk' Vol. XXXIX, page 416, July, 1922.)

Circus hudsonius. MARSH HAWK.—Not recorded by Beckham. Fairly common migrant and winter resident. October 13–April 18.

Accipiter velox. SHARP-SHINNED HAWK.**—"A common permanent resident." (B.) A regular breeder. Most numerous in the fall.

Accipiter cooperi. COOPER'S HAWK.**—"Sometimes rather common." (B.) Resident and breeding, but seemingly not as abundant as the last.

Accipiter atricapillus atricapillus. AMERICAN GOSHAWK.—Not recorded by Beckham. One record; a specimen taken December 1, 1917.

Buteo borealis borealis. RED-TAILED HAWK.***—Not recorded by Beckham. Permanent resident; breeds. More common in fall and winter.

Buteo lineatus lineatus. RED-SHOULDERED HAWK.*—"Permanent resident. Probably the most common Hawk found here." (B.) Occurs rather sparingly throughout the year, certainly not the most common Hawk. Never saw a nest, but the ovaries of a female shot March 6, 1915, indicated breeding.

Haliaeetus leucocephalus leucocephalus. BALD EAGLE.—Beckham includes this species on the strength of a newspaper report of an Eagle being killed near Boston in the county. About the year 1908, I saw an immature Bald Eagle that was captured alive near Nazareth Academy, two miles north of Bardstown. Several reports of Eagles lacking authenticity were brought to notice since 1912. In November, 1921, after I had left Kentucky, a mature Bald Eagle was captured near Bardstown. This specimen was viewed by my brother, R. A. Blincoe, who later gave me a description of it.

Cerchneis sparveria sparveria. SPARROW HAWK.**—"A common permanent resident." (B.) More noticeable in winter.

Pandion haliaëtus carolinensis. OSPREY.—Beckham records a specimen shot in April, 1882. I have two records of specimens taken; May 25, 1917, and October 18, 1919.

Tyto pratincola. BARN OWL.—Beckham includes this species on the strength of a single bird that was shot in Bullet County which lies adjacent to Nelson. I shot one in August 1914, saw one March 30, 1920, and two were sent to me for mounting during the summer of 1920.

Asio wilsonianus. LONG-EARED OWL.—Not recorded by Beckham. shot one January 16, 1914, and saw another March 7, 1917.

Asio flammeus. SHORT-EARED OWL.—Beckham records a single bird shot in November, 1881. I have two records: Dr. R. S. Tuttle, of Bardstown, shot one November 15, 1915, and the other was brought to me about a week later by a farm hand.

Strix varia varia. BARRED OWL.—Not recorded by Beckham. I have two records of specimens captured; March 7, 1915, and November 22, 1919.

Otus asio asio. SCREECH OWL.**—"A common permanent resident." (B.) The only really common Owl in the Bardstown region.

Bubo virginianus virginianus. GREAT HORNED OWL.*—"A rather common summer resident." (B.) My observations indicated that it was rare. Only one record; one captured in June, 1920, sent to me for mounting. Probably of frequent occurrence in the Knobs.

Nyctea nyctea. SNOWY OWL.—Beckham records one specimen. I saw a live nearly white specimen that was caught near Bardstown about 1905. Alexander Wilson, in his 'American Ornithology,' records a specimen taken at Bardstown (then "Bairdstown") in 1810.

Coccyzus americana americana. YELLOW-BILLED CUCKOO.**—"A common summer resident." (B.) Generally distributed but usually most abundant near streams. April 29–October 6.

Ceryle alcyon alcyon. BELTED KINGFISHER.*—"Rather common. Not observed in winter, but a few are doubtlessly to be found here at that season." (B.) I saw it in every month except January. Probably breeds but I have no direct evidence that it does so.

Dryobates villosus villosus. HAIRY WOODPECKER.**—"Permanent resident, not very common." (B.) I found it common as a resident, more noticeable in winter. The least abundant of the strictly resident Woodpeckers.

Dryobates pubescens medianus. DOWNY WOODPECKER.**—"A common permanent resident." (B.) One of the most generally distributed birds of the region.

Sphyrapicus varius varius. YELLOW-BELLIED SAPSUCKER.—"Winter resident." (B.) Found wintering only once, the winter of 1912–13. Usually a common migrant. March 21–April 27; September 21–October 17.

Phloeotomus pileatus pileatus. PILEATED WOODPECKER.—"An uncommon permanent resident in heavily wooded portions of the county." (B.) Probably this statement applies to this bird at the present time. On February 8, 1920, I saw one within a mile and a half of town in a piece of woodland along the Beech Fork River. Mr. J. R. Pemberton, formerly located at Louisville, Ky., but now of Tulsa, Okla., wrote me that he saw this species during the breeding seasons of 1917 and 1918 in Larue County which adjoins Nelson to the south-west.

Melanerpes erthythrocephalus. RED-HEADED WOODPECKER.**—"A permanent resident." (B.) Though common as a summer resident it was found to winter only once, the winter of 1912–13. April 16–October 2.

Centurus carolinus. RED-BELLIED WOODPECKER.**—"A common permanent resident." (B.) Mainly a woodland bird though frequently seen about farm houses and in town.

Colaptes auratus luteus. FLICKER.**—"An abundant permanent resident." Most abundant in the migrations.

Antrostomus carolinensis. CHUCK-WILL'S-WIDOW.—Not recorded by Beckham. I am indebted to Mr. Thos. J. Stocker of Bardstown for a specimen of this bird taken June 27, 1915, the first I had ever seen. One seen May 6, 1917. These are my only records.

Antrostomus vociferus vociferus. WHIP-POOR-WILL.***—"An uncommon summer resident. I have never heard it in the vicinity of Bardstown." (B.) Very common in all favorable localities. It was commonly heard calling; even in Bardstown the call was frequently heard.

Chordeiles virgianianus virginianus. NIGHTHAWK.—"Summer resident." (B.) Rather rare in summer; common in August and September. I have no evidence of its breeding.

Chaetura pelegica. CHIMNEY SWIFT.**—"An abundant summer resident." (B.) April 1–October 15.

Archilochus colubris. RUBY-THROATED HUMMINGBIRD.**—"A common summer resident." (B.) April 23–September 25.

Tyrannus tyrannus. KINGBIRD.**—"An abundant summer resident." (B.) Common but never as abundant as the three following species.

Myiarchus crinitus. CRESTED FLYCATCHER.**—"An abundant summer resident." (B.) April 16–August 15.

Sayornis phoebe. PHOEBE.**— "A common summer resident." (B.) Beckham states that he saw it in every month. My only winter record is of a bird seen February 6, 1917. February 23–October 29.

Myiochanes virens. WOOD PEWEE.**—"An abundant summer resident." (B.) April 30–October 4.

Empidonax flaviventris. YELLOW-BELLIED FLYCATCHER.—"Transient. Rather uncommon." (B.) A specimen collected September 4, 1920, is my only positive record.

Empidonax virescens. ACADIAN FLYCATCHER.**—"A common summer resident." (B.) Restricted to the vicinity of streams. May 5–August 19.

Otocoris alpestris praticola. PRAIRIE HORNED LARK.—"A common winter resident." (B.) Though most common as a winter bird, a few remain all through the summer and apparently breed. There are very few published records of the occurrence of this bird in Kentucky during summer, nevertheless, I believe that it will eventually be found breeding in many localities in north-central Kentucky.

Cyanocitta cristata cristata. BLUE JAY.**—"A permanent resident." (B.) Entirely absent from the Bardstown region in the winter of 1920–21, from November 27, to March 19.

Corvus brachyrhynchos brachyrhynchos. CROW.**—"An abund-

ant permanent resident." (B.) Holding its numbers well. Migratory flocks of thousands frequently seen in winter and early spring.

Dolichonyx oryzivorus. BOBOLINK.—Not recorded by Beckham. Common migrant. Very abundant in May 1917. April 22–May 27; August 18–September 28.

Molothrus ater ater. COWBIRD.**—"A common summer resident." (B.) Frequently seen in winter, sometimes occurring regularly in large flocks at that season. Eggs found in nests of Bachman's Sparrow and Indigo Bunting.

Agelaius phoeniceus phoeniceus. RED-WINGED BLACKBIRD.**—"A common summer resident." (B.) Generally distributed during the migrations but quite restricted during the breeding season. February 28,–October 29.

Sturnella magna magna. MEADOWLARK.**—"Resident all the year." (B.) At times scarce in winter.

Icterus spurius. ORCHARD ORIOLE.**—"A common summer resident." (B.) More generally distributed than the next species. April 19–August 23.

Icterus galbula. BALTIMORE ORIOLE.**—"A common summer resident." (B.) Not as abundant as the last. April 14–August 18.

Euphagus carolinus. RUSTY BLACKBIRD.—"Common during the migrations." (B.) Possibly common, but I identified it only on three occasions: December 10 and 12, 1917; and March 12, 1920.

Quiscalus quiscala aeneus. BRONZED GRACKLE.**—"A summer resident." (B.) A characteristic summer bird about Bardstown. Stragglers very rarely seen in winter. February 12–November 22.

Carpodacus purpureus purpureus. PURPLE FINCH.—"A common transient. A few probably winter here." (B.) Found wintering only once, the winter 1919–20. Frequently common as a migrant. October 22–May 2.

Astragalinus tristis tristis. GOLDFINCH.**—"Abundant permanent resident." (B.) At times extremely numerous in spring.

Spinus pinus pinus. SISKIN.—Beckham remarks that he saw two small flocks in November, 1882. I observed a flock of about fifteen individuals October 21, 1912.

Passer domesticus. ENGLISH SPARROW.**—Very abundant. According to Beckham it first appeared at Bardstown about the year 1879.

Pooecetes gramineus gramineus. VESPER SPARROW.*—"A common summer resident." (B.) Always quite common as a migrant but I never saw it during the breeding season. March 8–April 20; September 12–November 18.

Passerculus sandwichensis savanna. SAVANNAH SPARROW.—"Transient; abundant." (B.) Common as a spring migrant. March 3–April 12.

Ammodramus savannarum australis. GRASSHOPPER SPARROW.**—"A common summer resident." (B.) Very abundant in favorable localities. March 26–November 7.

Chondestes grammacus grammacus. LARK SPARROW.**—"An. abundant summer resident." (B.) Always common as a summer bird, much more abundant during some years than during others. April 11–August 17.

Zonotrichia leucophrys leucophrys. WHITE-CROWNED SPARROW. "Transient. Common in May." (B.) Previous to 1920 my observations corresponded with this statement. In the fall of 1920 it appeared October 7, and wintered. Previously I saw it only once in the fall, October 8, 1912. Always common in spring. April 23–May 16.

Zonotrichia albicollis. WHITE-THROATED SPARROW.—"Transient. Very common." (B.) Stragglers rarely seen in winter. March 3–May 14; September 28–December 8.

Spizilla monticola monticola. TREE SPARROW.—"A common winter resident." (B.) Rather common during the winter of 1911–12, after which it was not seen again until the severe winter of 1917–18. I was absent during the winter of 1918–19, but it was common the two following winters. December 22–March 21.

Spizella passerina passerina. CHIPPING SPARROW.**—"An excessively abundant summer resident." (B.) Common, but not as abundant as the next species. Never saw it in winter. March 14–October 26.

Spizella pusilla pusilla. FIELD SPARROW.**—"An abundant summer resident." (B.) Most abundant of the breeding Sparrows; frequently seen in winter.

Junco hyemalis hyemalis. SLATE-COLORED JUNCO.—"An abundant winter resident." (B.) October 8–April 25.

Peucaea aestivalis bachmani. BACHMAN'S SPARROW.***—"Rare. One specimen; shot April 28, 1877." (B.) Fairly common summer resident. March 18–September 1.

Melospiza melodia melodia. SONG SPARROW.**—In his first list[1] Beckham stated that this species was "an abundant resident," but in his later paper corrects this statement remarking that it was "quite scarce in summer." Though very abundant as a migrant and winter resident only a few pairs could be found in summer and these nested near some stream.

Melospiza lincolni lincolni. LINCOLN'S SPARROW.—"Transient. Not uncommon in May." (B.) On May 16, 1921, Mr. Albert F. Ganier showed me one of these birds in a brushy place near Bardstown. Likely fairly common as a migrant.

Melospiza georgiana. SWAMP SPARROW.—"Transient. Rather uncommon." (B.) Seen frequently in the spring but only once in fall. April 11–May 18; October 10, 1920.

Passerella iliaca iliaca. FOX SPARROW.—"Abundant during March and November, and common during some winters." (B.) Never saw it

[1] A List of the 'Birds of Bardstown, Nelson Co., Kentucky'. Jour. Ann. Soc. Nat. Hist., VI, 1883.

during mid-winter, and have only one fall record. February 21–March 21. November 22, 1917.

Pipilo erythrophthalmus erythrophthalmus. TOWHEE.***—"A common permanent resident." (B.) Sometimes scarce or absent during mid-winter.

Cardinalis cardinalis cardinalis. CARDINAL.**—"An abundant permanent resident." (B.) A characteristic bird of the region.

Hedymeles ludovicianus. ROSE-BREASTED GROSBEAK.—Beckham observed it only twice, in May, 1882. I saw it only once, April 27, 1920, a single male.

Passerina cyanea. INDIGO BUNTING.**—"An abundant summer resident." (B.) Well distributed and one of the most abundant summer birds. April 26–October 5.

Spiza americana. DICKCISSEL.**—"A very common summer resident." (B.) Very irregular in its occurrence, some years common, in others none are seen. May 1–July 13.

Piranga erythromelas. SCARLET TANAGER.—"Transient. Abundant in May and September." (B.) Common in May but I never identified it in fall. May 2–May 24.

Piranga rubra rubra. SUMMER TANAGER.**—"A common summer resident." (B.) April 16–October 5.

Progne subis subis. PURPLE MARTIN.**—"A common summer resident." (B.) March 23–September 6.

Petrochelidon lunifrons lunifrons. CLIFF SWALLOW.*—"A rather common summer resident." (B.) I observed it only twice, oddly on the same date both times; May 18, 1916, and May 18, 1921.

Hirundo erythrogaster. BARN SWALLOW.**—"An abundant summer resident." Hardly abundant, but common. April 12–September 20.

Stelgidopteryx serripennis. ROUGH-WINGED SWALLOW.*—"A common summer resident." (B.) My observations indicated that it was only a migrant. April 28–May 16.

Bombycilla cedrorum. CEDAR WAXWING.—"An irrgular, but at times very abundant, permanent resident." (B.) Usually scarce in mid-summer. Beckham did not find it breeding and I found nothing to indicate that it did.

Lanius ludovicianus migrans. MIGRANT SHRIKE.—Not included in Beckham's list. My observations seem to indicate that it was only a migrant and winter resident, but the regularity with which it appears each year during July suggests the probability that it breeds somewhere near the territory covered by my observations. July 16–April 5.

Vireosylva olivacea. RED-EYED VIREO.**—"An abundant summer resident." (B). One of the most common woodland birds. April 21–September 30.

Vireosylva gilva gilva. WARBLING VIREO.**—"A common summer resident." (B.) Regularly occurring as a summer resident though local in its distribution, and never very common. May 6.

Lanivireo flavifrons. YELLOW-THROATED VIREO.—"Rather common." (B.) Beckham thought that it bred. For many years I confused its song with that of the Red-eyed Vireo and considered it as a migrant only. In 1921 it was fairly common during summer. May 22–August 19.

Lanivireo solitarius solitarius. BLUE-HEADED VIREO.—"Transient. Not common." (B.) I observed it only once, April 25, 1917.

Vireo griseus griseus. WHITE-EYED VIREO.**—"Abundant in spring, rather common in summer." (B.) A typical bird in all localities where thickets are numerous. April 13–October 5.

Mniotilta varia. BLACK AND WHITE WARBLER.*—"An abundant summer resident." (B.) I found it rarely in April and May, very common in September, never seen in June and but once in July. April 12–October 8.

Helmitheros vermivorus. WORM-EATING WARBLER.—Not recorded by Beckham. I took two specimens, all that I ever observed; July 11, 1920, and April 24, 1921.

Vermivora pinus. BLUE-WINGED WARBLER.—"Common from April 10th to May 25th; a few probably remain to breed." Found regularly in one locality, each year, during May and June. May 1–June 15.

Vermivora peregrina. TENNESSEE WARBLER.—"Transient; sometimes common in the fall." (B.) Positively identified on September 7, 1919, only. Several questionable records.

Dendroica tigrina. CAPE MAY WARBLER.—"Rare; two specimens only; both taken in May." (B.) One seen in the orchard trees at my home, April 25, 1917, and the following day one was collected at the same place. My only records.

Dendroica aestiva aestiva. YELLOW WARBLER.**—"A common summer resident." (B.) Confined to the willows along streams in breeding season. April 16–July 27.

Dendroica caerulescens caerulescens. BLACK-THROATED BLUE WARBLER.—"Transient. Common." (B.) I found it only fairly common. May 6–May 8; seen only once in the fall, September 5, 1920.

Dendroica coronata. MYRTLE WARBLER.—"An abundant winter resident." (B.) Commonly and regularly wintering but seldom abundant. October 7–May 13.

Dendroica magnolia. MAGNOLIA WARBLER.—"Transient; abundant." (B.) May 6–May 29; September 5–October 3.

Dendroica pensylvanica. CHESTNUT-SIDED WARBLER.—"Transient. Common." (B.) Positively identified only twice; May 12 and 13, 1921.

Dendroica cerulea. CERULEAN WARBLER.**—"A common summer resident." (B.) Found in only a few localities. April 24–August 19.

Dendroica castanea. BAY-BREASTED WARBLER.—"Transient. Not common." (B). A singing male identified on May 18, 1921, is my only record.

Dendroica striata. BLACK-POLL WARBLER.—"Transient. Rather uncommon." (B.) One identified April 25, 1914, is my only certain record.

Dendroica fusca. BLACKBURNIAN WARBLER.—"Transient; very common in September." (B.) May 7–May 14; September 5–October 7.

Dendroica dominica albilora. SYCAMORE WARBLER.**—"A common summer resident." (B.) Restricted to the vicinity of streams during the breeding season. March 27–October 4.

Dendroica virens. BLACK-THROATED GREEN WARBLER.—"Transient. Very common." (B.) The most abundant of the fall transient Warblers, but not very common in spring. Beckham saw one, July 14, 1882. April 30,–May 18; September 5–October 17.

Dendroica palmarum palmarum. PALM WARBLER.—"Transient. Quite common." (B.) More common in the spring migration than in the fall. Beckham observed it on several occasions in the months of December and January. In the fall of 1920, I observed several individuals in a certain locality quite regularly until near the end of December. April 17–May 13; September 28–December 28.

Dendroica discolor. PRAIRIE WARBLER.***—"Common in the spring. So far as my observations have extended, this Warbler is transient here, but for reasons too lengthy to mention now, I feel quite sure that a few of them breed." (B.) I found it a fairly common breeding bird in several localities. April 13–September 7.

Seiurus aurocapillus. OVENBIRD.—"Common in spring and fall." (B.) I found it common in the fall only. Rarely seen in late May, suggesting the possibility of its breeding. Beckham inferred that it was likely a breeder. September 4–October 6.

Seiurus noveboracensis. WATER THRUSH.—"Transient. Rare." (B.) I have three records: September 21, 1919; May 12, 1921; and one collected May 13, 1921. I am in doubt as to the sub-specific identity of the specimen collected.

Seiurus motacilla. LOUISANA WATER-THRUSH.**—"An abundant summer resident." (B.) A common bird along the Beech Fork River and in all other suitable localities. March 20–August 15.

Oporornis formosus. KENTUCKY WARBLER.**—"A common summer resident." (B.) A characteristic summer bird in all damp thickets and woodland. April 22–September 28.

Oporornis philadelphia. MOURNING WARBLER.—"Transient; rather rare." (B.) I observed it only twice; May 20, 1917, and May 18, 1920.

Geothlypis trichas trichas. MARYLAND YELLOW-THROAT.**—"An abundant summer resident." (B.) The most abundant and widely distributed of the breeding Warblers of the county. April 22–October 5.

Icteria virens virens. YELLOW-BREASTED CHAT.**—"A common summer resident." (B.) A characteristic summer bird in the more brushy sections. April 27–September 10.

Wilsonia citrina. HOODED WARBLER.—"But two specimens—April 19th and May 9th, 1877." (B.) I saw it but once; a singing male, April 30, 1920. This bird might be expected to breed in the Bardstown region but I am convinced that it did not occur as a summer bird in the territory with which I was familiar.

Wilsonia canadensis. CANADIAN WARBLER.—"Transient. Abundant in May." (B.) I saw it only once; a singing male observed May 18, 1921.

Setophaga ruticilla. REDSTART.*—"Summer resident. Very abundant during the migrations, but not very common in summer." (B.) I found it common in fall, but rare in spring and summer. May 6–October 3.

Anthus rubescens. AMERICAN PIPIT.—"Transient." (B.) Common as a migrant, and sometimes occurring as an irregular winter resident. October 26–April 20.

Mimus polyglottos polyglottos. MOCKINGBIRD.**—"A common summer resident. A few remain all the year." (B.) Not as abundant in 1921 as ten years previously, but still common. Only a few wintered.

Dumetella carolinensis. CATBIRD.**—"A common summer resident." (B.) More abundant than the Mockingbird or Brown Thrasher. April 19–October 10.

Toxostoma rufum. BROWN THRASHER.**—"Common summer resident." (B.) March 6–October 13.

Thryothorus ludovicianus ludovicianus. CAROLINA WREN.**—"An abundant permanent resident." (B.) Mainly a woodland bird, but a few were of regular occurrence in Bardstown.

Thyromanes bewicki bewicki. BEWICK'S WREN.**—"Not uncommon. Probably a permanent resident as I have seen them in midwinter." (B.) Very abundant in summer, entirely replacing the House Wren. Every farm had one or several pairs and very numerous in towns. A few always wintered but never sang, as did the Carolina Wren, at that season.

Troglodytes aëdon aëdon. HOUSE WREN.—Not recorded by Beckham. I saw it only twice, May 8, and 12, 1920.

Nannus hiemalis hiemalis. WINTER WREN.—"A rather common winter resident." (B.) I found it mainly as a migrant, rarely seen in winter. October 7–April 27.

Certhia familiaris americana. BROWN CREEPER.—"A winter resident; sometimes quite common in spring." (B.) I found it only rarely in fall and winter, but generally common in spring. October 8–April 15.

Sitta carolinensis carolinensis. WHITE-BREASTED NUTHATCH.*—"A common permanent resident." (B.) I found it restricted entirely to the woodlands along the Beech Fork River. Though frequently seen in several localities, at no time was one seen over five or six hundred yards from the river bank. Not abundant but probably breeds.

Sitta canadensis. RED-BREASTED NUTHATCH.—"An irregular fall and winter visitant but whenever present always quite common." I found it very irregular in spring, fall and winter. Common during the fall of 1912, and during the following winter; also abundant during the spring of 1920. Uncommon during other years, and some winters and

migrations passed without recording a single individual. October 6–May 4.

Baeolophus bicolor. TUFTED TITMOUSE.**—"An abundant permanent resident." (B.) The most common, abundant, and regularly observed of the resident woodland birds. Almost as abundant in the cleared sections, especially in winter.

Parus carolinensis carolinensis. CAROLINA CHICKADEE.**—"An abundant permanent resident." (B.) Hardly as numerous as the last, but quite common.

Regulus satrapa satrapa. GOLDEN-CROWNED KINGLET.—"Transient, but a good many winter here." (B.) I found it rather rare in winter. Extremely abundant in the spring migration of 1917, but later comparatively scarce. October 1–April 18.

Regulus calendula calendula. RUBY-CROWNED KINGLET.—"Transient. Abundant in spring and fall." (B.) I found it more abundant in spring. April 3–May 7; September 27–November 7.

Polioptila c. caerulea. BLUE-GRAY GNATCATCHER.**—"An abundant summer resident." (B.) Strictly a woodland species during the nesting season, but found in orchards, sparsely wooded pastures, etc., during migrations. March 23–September 6.

Hylocichila mustelina. WOOD THRUSH.*—"A common summer resident." (B.) I found it rare, in only a few localities, in May and June. Certainly not common, at least in the territory within a few miles of town.

Hylocichla aliciae aliciae. GREY-CHEEKED THRUSH.—"Transient; common during the last week of April and the first week of May." (B.) Probably a very common migrant but I experienced much difficulty in accurately separating it from the next in the field. One collected May 13, 1921.

Hylocichla ustulata swainsoni. OLIVE-BACKED THRUSH.—"The most abundant of the Thrushes during the migrations, except the Robin." (B.) I found it very abundant in May. May 10–May 18.

Hylocichla guttata pallasi. HERMIT THRUSH.—"Transient; common." (B.) I found it a common migrant usually appearing early in April. March 7–April 24; October 7–November 8.

Planesticus migratorius migratorius. ROBIN.**—"A permanent resident." (B.) Extremely abundant in the migrations; fairly numerous during the breeding season; generally wintering but irregular in abundance.

Sialia sialis sialis. BLUEBIRD.**—"A common permanent resident." (B.) A characteristic resident species; generally not abundant in winter.

SPECIES OF RECENT INTRODUCTION.

Phasianus torquatus. RING-NECKED PHEASANT.—About seven or eight years ago several of these birds were liberated at the country home of Congressman Ben Johnson near Bardstown, but apparently they did not succeed in establishing themselves.

Lophortyx gambeli. GAMBEL'S QUAIL.—In July, 1921, one of these birds was brought to me and, not knowing, that several pairs had been liberated early the preceding spring, near Bardstown, I was greatly surprised. Several hundred of these birds were distributed in various parts of Kentucky by the State Game and Fish Commission under the name, "Mexican Quail."

SPECIES RECORDED IN BECKHAM'S LIST FOR WHICH I HAVE NO RECORDS.

Podilymbus podiceps. PIED-BILLED GREBE.—"Transient; common on the streams and ponds in early spring." (B.) "Die-dippers" were frequently reported but I never saw one.

Nettion carolinense. GREEN-WINGED TEAL.

Querquedula discors. BLUE-WINGED TEAL.—Beckham found both Teal common migrants. Personally, I did not identify either of them, though the late Monroe Hurst of Bardstown was familiar with them, having taken specimens in the county.

Marila collaris. RING-NECKED DUCK.—Beckham took a single bird, February 16, 1883, the only time he ever met with it.

Casmerodius egretta. AMERICAN EGRET.—"Mr. J. W. Fowler, of Louisville, informs me that he shot one of these Herons in October, 1881, near Fairfield, in this county." (B.)

Egretta candidissima candidissima. SNOWY HERON.—"A hunter informs me that several years ago he shot a 'white fly-up-the-creek' near here, which is probably referable to this species." (B.) From the foregoing statement it is evident that Beckham included this species in his list without sufficient evidence of the proper identification of the specimen referred to by the hunter.

Nycticorax nycticorax naevius. BLACK-CROWNED NIGHT HERON.—"Transient in May." (B.)

Grus americana. WHOOPING CRANE.

Grus mexicana. SANDHILL CRANE.—Both included by Beckham on the authority of an old resident of the county.

Rallus virginianus. VIRGINIA RAIL.—"Transient. Rare; but one specimen—May 10th, 1882." (B.)

Coturnicops noveboracensis. YELLOW-RAIL.—"The only time I have ever met with this Rail was on October 1, 1880, when a male and female were shot in an old briary field." (B.)

Ionornis martinicus. PURPLE GALLINULE.—Beckham relates an incident concerning the capture of a "strange looking bird" at the time he was ten or twelve years of age which, later, he recognized as this species.

Meleagris gallopavo silvestris. WILD TURKEY.—"Said to still occur sparingly in the western part of the county." (B.) Doubtless extinct.

Ectopistes migratorius. PASSENGER PIGEON.—"Excessively common during some falls, but not nearly as abundant as formerly. There was an enormous flight of them here about fifteen years ago." (B.) In 1917, I was told, by an old resident of Nelson County, who had been

familiar with the Wild Pigeons, that he saw the last of them about twenty years before.

Cocyzus erythrophthalmus. BLACK-BILLED CUCKOO.—"A rather uncommon summer resident." (B.) I have several doubtful records for this species.

Empidonax minimus. LEAST FLYCATCHER.—"Transient in April and May. Common." (B.)

Passerherbulus henslowi henslowi. HENSLOW'S SPARROW.—Beckham took a single specimen, October 30, 1884, the only one he ever saw.

Loxia curvirostra minor. CROSSBILL.—Beckham observed this species in November, 1882, and in March, 1883, he collected several specimens.

Riparia riparia. BANK SWALLOW.—"A common summer resident." (B.) Notwithstanding, Beckham considered it doubtful as a breeding species.

Vireosylva philadelphica. PHILADELPHIA VIREO.—"Rare. One specimen only; shot May 19th, 1877." (B.)

Vermivora rubricapilla rubricapilla. NASHVILLE WARBLER.—"Transient; not common." (B.)

Vermivora celata celata. ORANGE-CROWNED WARBLER.—"Transient." (B.) This very brief remark is Beckham's full statement concerning this Warbler.

Compsothlypis americana. PARULA WARBLER.—"A common summer resident." (B.) I never identified it at all; if it occurred as a summer resident, during my period of observation, it was quite restricted in its distribution. Beckham was in doubt as to its breeding about Bardstown.

Vermivora chrysoptera. GOLDEN-WINGED WARBLER.—"On May 11th, 1877, while sauntering through my favorite collecting ground, I saw four or five warblers skipping about the top of a small willow tree; getting two of them in line, I fired, and down came this bird and a Cape May Warbler—two species entirely new to me, and both very rare in this locality." (B.) The only one observed by Beckham.

Dendroica vigorsi. PINE WARBLER.—"Transient." Common in April and September." (B.)

Oporornis agilis. CONNECTICUT WARBLER.—"I have taken it only twice in the spring—May 12th, and 13th, and once on the fall—October 11th." (B.)

Wilsonia pusilla pusilla. WILSON'S WARBLER.—"Transient in May; not common." (B.)

Cistothorus stellaris. SHORT-BILLED MARSH WREN.—"I have never seen but one specimen of this wren, a male, which was shot May 1st, 1882, from the top of a small blackberry vine in a rye field, while singing, if the queer stridulous noise he made can be called singing." (B.)

Hylocichla fuscescens. WILSON'S THRUSH.—"I have only seen this bird upon two occasions in the spring, and have never recognized it at all in the fall." (B.)

Covington Pike,
Dayton, Ohio.

A NEW LEPIDOCOLAPTES.

BY ELSIE M. B. NAUMBERG.

Lepidocolaptes angustirostris hellmayri, new subspecies.

Subspecific Characters.—Similar to *Lepidocolaptes angustirostris bivittatus*, but larger with longer, more powerful bill; back, wings and tail generally of a deeper rufous; underparts conspicuously streaked with dusky or blackish brown, especially on the sides. Similar also to *Lepidocolaptes angustirostris angustirostris* and *Lepidocolaptes angustirostris certhiolus* but larger, with longer bill and upperparts much brighter chestnut rufous, without any trace of brownish suffusion. In the color of the upper parts it differs in the same way from *L. a praedatus.*

Type.—No. 139335, Amer. Mus. Nat. Hist.; ♂ ad.; Chilon, Prov. Santa Cruz, Bolivia (alt. 5,600 ft.); Oct. 6, 1915; Miller and Boyle. Wing, 105; tail, 81; exp. culmen, 35.5.

Range.—Subtropical Zone of the Andes of Bolivia; in provinces of Cochabamba (Vinto, Parotani, Tujina, San José, Olgino, Trigal, Rio Mizque); Santa Cruz (Chilon, Valle Grande, Samaipata), and Tarija (Tarija).

Specimens Examined: Lepidocolaptes angustirostris hellmayri.—Bolivia: Prov., Santa Cruz, Chilon, 2 ♂, 2 ♀; Prov. Sucré, Rio Cachimayo, 1 ♂; California, 1 ♀; Prov. Cochabamba, Vinto, 1 ♂, 1 ♀; Parotani, 1 ♂. Measurements of male: wing, 105–111; tail, 88–96; culmen, 35–40. Measurements of female: wing, 98–104; tail, 78–90; culmen, 35–40.

Lepidocolaptes angustirostris angustirostris.—Paraguay: Fort Wheeler, 3 ♂; Rio Negro, 2 ♂, 1 ♀; Trinidad, 1 ♂; Puerto Pinasco, 1 ♂, 1 ♀.

Lepidocolaptes angustirostris bivittatus.—Brazil: Matto Grosso, Chapada, 4 ♂, 3 ♀.

Lepidocolaptes angustirostris praedatus.—Argentina: Buenos Aires, Platanos, 1 ♂; Islas del Parana, 1 ♂.

Lepidocolaptes angustirostris coronatus.—Brazil: Santarem, 1 ♂; Amazon, 1 ♂.

All specimens so far examined are from the Subtropical Zone between the altitudes of 5600 and 9000 feet, where it clearly replaces its allies. On the north slope of Buena Vista and at the eastern base—around Cabezas and Abapo—other forms, *Lepidocolaptes angustirostris bivittatus* and *Lepidocolaptes angustirostris certhiolus* respectively, are met with.

Dr. Hellmayr, who has gone over this group very thoroughly, writes: "This form combines the plain rufous back of the eastern

races (*bivittatus—coronatus*) with the streaked underparts of the western races (*angustirostris—certhiolus*); differs, however, from both by larger size and longer bill, in which respect it closely resembles *praedatus* of the La Plata region."

American Museum of Natural History,
New York, N. Y.

A NEW HAZEL GROUSE FROM THE PROVINCE OF SZECHWAN, CHINA.

BY J. H. RILEY.[1]

LAST year the U. S. National Museum received quite a large collection of specimens from the Reverend David C. Graham from the mountains of western Szechwan. Among the birds were three skins of a grouse that were identified at the time as *Tetrastes sewerzowi*. Recently the National Geographic Society has presented to the National Museum the material collected by Dr. F. R. Wulsin, during his recent journeys in China. These collections contained an adult male specimen of *Tetrastes sewerzowi* from Choni, Kansu, about sixty miles south of Labrang. Upon comparison, the Szechwan specimens were found to be a much more reddish brown above and on the chest and to present some other differences from the Kansu bird.

Taking advantage of Dr. Peter P. Suschkin's visit to Washington, the above specimens were shown to him, and he agrees with me that the Szechwan specimens evidently represent a distinct form. He informs me that Przewalski collected around Labrang and that his type probably came from that vicinity. This makes the Choni specimen practically topotypical. It certainly agrees with the description and fairly well with the copy of the plate given in Rowley's Orn. Misc., vol. 2, pt. 10, 1877, 430, pl. 8, except that the dark barring above and below is depicted in the plate as brown instead of blackish as indicated in the description. The new form may be known as:

[1] Published by permission of the Secretary of the Smithsonian Institution.

Tetrastes sewerzowi secunda subsp. nov.

Type, adult male, U. S. National Museum, No. 277457, near Tatsienlu, Szechwan, China, alt. 12000 feet, July 28, 1923, collected by David C. Graham.

Similar to *Tetrastes sewerzowi* Przewalski, but the brown bars above and on the chest near hazel instead of buffy brown; the lesser and greater wing-coverts and the scapulars with a rather broad white shaft spot at the tip; the incipient neck-ruff with a few white spots; below the black bars seem to be broader, especially on the upper chest; and the flanks are more tawny. Wing, 161; culmen, 14; tarsus, 37; middle-toe, 34.5 mm.

Remarks.—Two of the specimens examined are males and one is a female. The two males are in molt and are acquiring new tails. The second male is more of a hazel brown than the type. The specimen marked as a female, I suspect, is really a young male, as it seems to be acquiring a black throat. It is more tawny than the other two specimens, has the white spotting on the wing-coverts and scapulars much reduced, and the white bars on the breast broader.

The Szechwan specimens all came from 11,000 to 12,000 feet altitude near Ü Long Kong, a place about ten miles from Tatsienlu, on the small river that flows northward into that town and were taken between July 28 and August 3.

U. S. National Museum,
Washington, D. C.

DISEASES OF THE RUFFED GROUSE.

BY ALFRED O. GROSS.

DURING the course of life history studies now being made at Bowdoin College, Brunswick, Maine, and in field work conducted in southeastern New York for the Roosevelt Wild Life Forest Experiment Station, Syracuse, New York, certain diseases of the Ruffed Grouse have come to my attention. Since these diseases may have an important bearing on the periodic fluctuation in the numbers of the Ruffed Grouse it seems desirable to make a preliminary report on the birds examined. Thus far 17 birds in the flesh, 9 males and 8 females, have been received; 2 from New York,

5 from Connecticut, 1 from Rhode Island, 1 from Massachusetts, and 8 from Maine. In addition to the entire birds, 44 stomachs have been examined for the presence of the stomach worm *Dispharynx*. The major part of the stomach material was received from Dr. John C. Phillips, and from members of hunting clubs in Massachusetts and New York. It is earnestly hoped that the report of these diseases will stimulate a further interest in the examination of all Ruffed Grouse found dead and of any birds killed which present symptoms of disease. The problem of the "Grouse Disease" is not a simple one and we need the cooperation of every one who is interested in the welfare and future of the Ruffed Grouse. Of the 17 birds noted above, 8 were killed and 9 were found dead. Of the latter, 2 had met death by violent plunges into buildings and 1 by flying into telephone wires. Two of the birds found dead died as the result of injuries received in some unknown way, and they seemed to be normal as far as the presence of any disease was concerned. None of the 9 birds found dead had been shot so far as could be determined. The cases of parasites and diseases among the 17 birds are as follows: *Dispharynx* 6, Pulmonary Mycosis 2, Tuberculosis 3, Ascaridia 1, and 1 bird apparently died from the effects of a large abnormal growth dorsal to the abdominal viscera. All of the 44 stomachs examined were free from parasites. Following is a brief statement of the diseases noted:

DISPHARYNX PARASITISM.

Dispharynx is a parasitic nematode worm which usually becomes established in the proventriculus and in later stages spreads to the muscular walls of the stomach. This parasite was noted in the Ruffed Grouse by Dr. A. A. Allen in specimens which he examined at Cornell University, Ithaca, New York. In the Bulletin of the American Game Protective Association, Vol. 13, No. 1, January, 1924, and in other articles Dr. Allen refers to this worm under the name *Dispharagus*. According to Dr. B. H. Ransom of the U. S. Biological Survey, Washington, D. C., the genus *Dispharynx* Dujardin, 1845, is not in good standing, as it appears to be a synonym of the genus *Acuaria* Bremser, 1811. This genus belongs to the family *Acuariidae* in the super-family Spiruroidea.

In the 1925 winter issue of the *Maryland Conservationist* Dr. Allen corrects the name *Dispharagus* and states: "A review of the literature and a study of the worm by Miss Elizabeth L. Keyes indicates that it should be called *Acuaria spiralis* Mol. unless it is a new species." In order to justify the use of the name *Dispharynx* and to avoid confusion in the nomenclature of this parasite, the following statement by Dr. Ransom, the foremost authority on this group, is important. "In 1912 Railliet, Henry and Sisoff divided the genus *Aucaria* into five sub-genera, two of these sub-genera being *Dispharynx* and *Cheilospirura*. *Cheilospirura* had already been made a genus by Diesing in 1861, and has been quite commonly accorded generic rank. *Dispharynx* is still used as a subgenus by many writers, but has been used as a genus, and would be used by writers who are inclined to disregard sub-genera and to recognize sub-genera as of generic rank or else disregard them entirely. We are inclined to accord generic rank to *Cheilospirura* and *Dispharynx*, but at the same time we would recognize the more extensive genus *Acuaria* as used by writers who disregard these two names either as genera or sub-genera. We would prefer to use the two genera *Cheilospirura* and *Dispharynx* and in any case would not use the generic name *Dispharagus*."

According to Dr. Allen *Dispharynx* has been the cause of death of some of the birds he has reared in captivity, and as the parasite has a wide distribution in wild birds he thinks it is one of the most important factors concerned with the present scarcity of Ruffed Grouse. In nearly all of the cases of *Dispharynx* examined at Bowdoin College, the infection was in its initial stages and I doubt if in any of the 6 cases could the death of the bird be attributed solely to the presence of the worms. The specimens infested with *Dispharynx* are as follows:

No. 16. Adult male killed near Brunswick, Maine, on November 5, 1923, by C. G. Weymouth. Weight 632 grams. Crop contents: 217 leaves of clover, 19 grams; 86 alder buds, 22 grams; 51 birch buds, 6 grams; miscellaneous leaves, 2 grams; total, 49 grams. Infection slight; only a few worms present.

No. 17. Adult male that killed itself by flying violently against the Science Building, Brunswick, Maine, April 14, 1924. Bird found by Mr. R. Pike and donated by him to the laboratory.

Weight 654 grams. Crop contained 3.3 grams of buds and blossoms of the maple. Proventriculus infested with several worms.

No. 21. Juvenal male that killed itself by flying against Hyde Hall, Bowdoin College, Brunswick, Maine, October 28, 1924. Weight 460 grams. Infection slight.

No. 28. Adult male killed on Pound Ridge, Westchester County, New York, on November 2, 1924, by Charles E. Hope of White Plains, New York. Infection slight; only 5 worms found.

No. 29. Adult male found dead in a frozen condition near Stratford, Fairfield County, Connecticut, on November 22, 1924, by George Bartlett and sent to Bowdoin College by Mr. J. W. Titcomb of the Connecticut State Board of Fisheries and Game, Hartford, Connecticut. Bird greatly emaciated, weighing only 486 grams. The proventricular walls were filled with these worms but none were found in the walls of the stomach. *Dispharynx* was combined with Pulmonary Mycosis.

No. 31. Adult male found under a laurel bush at the base of the Taghkanic Mountains, 6 miles north of Millerton, Dutchess County, New York, on November 23, 1924. Bird discovered by Frederic L. Conklin and was sent to me by Dr. W. A. Knapp of Millerton, New York. Fifteen worms were found in dissecting the walls of the proventriculus. *Dispharynx* was combined with Avian Tuberculosis.

The above 6 cases of *Dispharynx* represent four distinct localities and three different States, indicating that the infections are not local but distributed over a very extensive area. According to Dr. Ransom all of the worms are of one species, apparently a new species, of *Dispharynx*. It is interesting to note that all of the above cases of the parasite were in male birds. As noted above, *Dispharynx* was not the sole cause of death of any of these birds. Birds Nos 16 and 28 were shot. Birds Nos. 17 and 21 killed themselves by flying into buildings. It would be extremely interesting to examine other birds which have killed themselves in a similar manner as some relation might be found to exist between the so-called "crazy flight" and the presence of the stomach worms. Dr. Allen informs me that he has examined a similar case. The parasites undoubtedly cause a severe irritation that might be the initial cause of this peculiar behavior. During the past season

the Maine newspapers reported numerous cases of birds flying into buildings of towns and cities but I was unable to secure any of them for examination.

Birds Nos. 29 and 31 were found dead, but both of these cases were complicated by the presence of other diseases which apparently were the primary cause of death. The *Dispharynx*, however, probably weakened the resistance of these two birds so that the diseases could more readily become established.

PULMONARY MYCOSIS.

Mycosis is a general term applied to infections with Hyphomycetes and in the cases under consideration it concerns the growth of *Aspergillus* in the lungs and air sacs of the birds. Mycosis is well known to breeders of Chickens, Ducks and Ostriches, under the name of Aspergillosis and Brooder Pneumonia. It also occurs among birds confined in zoological parks, but I know of no cases on record where it has occurred in the Ruffed Grouse living in the wild state. The author is indebted to Dr. E. E. Tyzzer of the Department of Comparative Pathology, Harvard Medical School, for the determination of two cases of Pulmonary Mycosis. He reports as follows: "The lesions in the lungs of both birds are acute and consist of leucocytes in association with an abundant growth of mycelium. This fungus has in one place fruited and the appearance is characteristic of *Aspergillus fumigatus.*" The tubercles are very conspicuous even in surface views of the lungs, and range in size from many small ones, 2 to 5 millimeters, to one in bird No. 59 which was 10 millimeters wide and 15 millimeters long. Sections of the lungs revealed numerous growths of tubercles throughout the tissue. A superficial examination of such tubercles suggests the presence of tuberculosis but microscopical preparations do not have the ascid fast bacilli, the giant cells, and other characteristics of the disease, but do show the presence of numerous leucocytes and an abundant mycelial growth." The two specimens in which Dr. Tyzzer has made the diagnosis of Pulmonary Mycosis are as follows:

No 29. Adult male found dead and frozen near Stratford, Fairfield County, Connecticut, on November 22, 1924, by George Bartlett and sent to the Biological Laboratory, Bowdoin College,

by Mr. J. W. Titcomb of the State Board of Fisheries and Game. This bird was in a moulting condition, which may have reduced its resistance to disease. It was greatly emaciated, weighing only 486 grams. The crop contained small acorns of a total weight of 13 grams. This bird was also infested with *Dispharynx* as noted above. In this specimen the lesions had extended to the axillary air sacs and in a lesser degree to the viscera.

No. 59. Found dead in the woods near Union, Knox County, Maine, November 27, 1924, by William C. Gleason, and sent to the Biological Laboratory, Bowdoin College, by Hon. Willis E. Parsons, Commissioner of Inland Fisheries and Game, Augusta, Maine. This bird was also a male and moulting. It was very thin, weighing only 373 grams. It was smaller and the measurements as a whole were less than in the preceding specimens, and it appeared to be a young bird of the year. If this be true, then it indicates the rapidity with which an infection of Mycosis may work. The crop contents consisted of 6 beechnuts, weighing 2.7 grams; frozen apples, 7.1 grams; and bits of leaves, about 0.1 gram; total contents, 9.9 grams. The left lung of this bird is all more or less congested, one giant almond-shaped tubercle being 10 by 15 millimeters in size. Cross sections of the right lung also show numerous cheese-like tubercles throughout the tissue.

As in most of the cases of *Dispharynx* the presence of this disease did not result in the loss of appetite of the victim but the birds ate well up to the time of their death. The fact that one of these birds was found in Maine and the other in Connecticut indicates that Mycosis may be a common and widespread disease during certain years when conditions are favorable for infections and for its growth.

AVIAN TUBERCULOSIS

Avian Tuberculosis like Mycosis is a common disease in poultry and in birds confined in zoological parks and gardens, but is seldom found in the free wild birds. Dr. Morton Grinnell (Avian Tuberculosis, *Forest and Stream* 1887, vol. 27, p. 503) during December, 1886, made a post mortem examination of a male and a female Ruffed Grouse which had been kept in captivity for a period of about six weeks before death. A third specimen died of the same

symptoms but was not examined. According to Dr. Grinnell the organs of the male showing acute disease were the lower part of the small intestine near the cæca, the liver, and probably the spleen. The nodules of the intestine were located in the submucous coat and those of the liver were beneath the peritoneal covering. Under the microscope these bodies proved to be tubercles with the characteristic cheesy broken-down center, surrounded by the giant or aggregated white cells, and in and around these, the colonies of bacilli. The diagnosis of Tuberculous Peritonitis was made. The male bird came from Wisconsin, the hens, one from Michigan and the other from New York, showing a wide distribution.

I am indebted to Mr. B. B. Burbank for making microscopical preparations from a large series of tissues and for making the preliminary examinations of my material. I am also indebted to Dr. F. N. Whittier, late professor of Bacteriology of Bowdoin College, for the diagnosis of Tuberculosis. Although it is probable the disease found is the Avian type of Tuberculosis we cannot be certain of this as the disease was not suspected until all of the material had been preserved, and hence no inoculations were made either on culture media or in other animals to further test the nature and types of the tubercle bacilli. The bovine and human types of the bacilli, according to Herbert Fox, M.D.,[1] have been found in birds, although not commonly.

Positive determinations were made on three specimens of my material, one from Maine, one from Connecticut and another from New York. The history of these birds is as follows:

No. 25. Female Ruffed Grouse secured at Jackson, Maine, November 12, 1924, by Dr. F. E. Norris and sent to my laboratory by S. H. Howes for examination because of the large numbers of a nematode worm, *Ascaridia lineata* (species?) found in the intestinal cavity. (These worms are frequently found in wild birds but so far as I can ascertain have not been proven to be a serious menace to the host. Nevertheless a thorough investigation should be made of these parasites of which so little is known concerning their pathological effects.) The bird was sent without legs and parts of the wings, hence the weight, 360 grams, cannot be used for comparative purposes. The bird seemed to be in

[1] Fox, Herbert, 1923, Disease in Captive Wild Mammals and Birds, p. 513.

fairly good physical condition. There were acute lesions in the lungs, but the abdominal viscera were not examined.

No. 31. Adult male Ruffed Grouse found dead 6 miles north of Millerton, Dutchess County, New York, by Frederic L. Conklin and sent to me by Dr. W. A. Knapp of Millerton, New York. This bird was also infested with *Dispharynx* as indicated above, and this with Tuberculosis was the apparent cause of death.

No. 78. Female Ruffed Grouse found by Charles Allshouse of Granby, Connecticut. The bird was alive when found but was unable to fly more than a few feet. It was kept in captivity until it died. There were acute lesions of the liver, small intestine and left lung. Weight only 341 grams. Crop empty. Contents of stomach comprised poultry food obtained in captivity.

Tuberculosis, from the standpoint of human welfare, is a most important disease, and if it is common and widespread among wild birds it should receive the attention of all interested in the Grouse problem.

DISEASE NOT IDENTIFIED.

No. 81. Female Ruffed Grouse found by Thomas Lee, February 21, 1925, in a peach orchard near Danbury, Connecticut. Bird sent to State Board of Fisheries and Game by A. J. Williamson, game warden at Bridgeport, Connecticut. Body in bad condition when received by me and apparently had been dead for a long time before it was found. The bird, according to measurements, was an adult but it weighed only 336 grams. Crop empty. Stomach contents only 3.9 grams.

Lying dorsal to the abdominal viscera in the region of the ovary was a large somewhat rounded mass roughly measuring $2\frac{1}{2} \times 3 \times 1\frac{1}{2}$ centimeters. On section this body appeared to be of the nature of coagulum. The ovary is not involved and appears normal. The cæca appear normal and no other lesions are apparent. Dr. E. E. Tyzzer also examined stained sections of the mass in which blood vessels could be distinguished but otherwise, because of poor preservation, without sufficient character for diagnosis.

The examinations thus far made emphasize the importance of making autopsies of the entire bird. Most of the 17 birds received at Bowdoin were sent because disease was suspected, but even so,

there is a surprising number of diseases in this small number of birds. In addition to the diseases mentioned we need to give some attention to external parasites. For example, the blood sucking Hippoboscid fly, *Ornithoponus americanus* (Leach) has been reported from New York and from various localities all over New England this past season. These flies may prove to be the secondary hosts of some of the internal parasites or may prove to be the carriers of disease which would tend to spread and multiply the number of cases. If this be true certain phases of the life history of these insects may be correlated with the periodic decrease in the numbers of Ruffed Grouse. It is also desirable to examine all birds for lice, mites and ticks, and when these parasites are found they should be preserved for microscopical examination. It is also very desirable to have an abundance of living material, both birds and parasites, for extensive experimental work. We need the assistance of all sportsmen and others who are in a position to secure material for our investigations. I wish to express my appreciation for the splendid cooperation already given me by the Conservation Commissions of Connecticut, Massachusetts and Maine. It will be necessary to make examinations of large numbers of specimens and a complete life history and ecological study extending over a period of several years must be completed, before we can hope to make generalizations concerning the conservation and perpetuation of the Ruffed Grouse. The primary purpose of this brief preliminary report is to stimulate interest in the further investigation of all phases of this important ornithological problem.

Roosevelt Wild Life Forest Experiment Station,

The New York State College of Forestry, Syracuse, New York.

BIRDS OF THE BROWNSVILLE REGION, SOUTHERN TEXAS.

BY LUDLOW GRISCOM AND MAUNSELL S. CROSBY.[1]

IN recent years interest in the bird-life of southern Texas has greatly increased, and more and more people are visiting a region which is a veritable paradise for the ornithologist. There is no satisfactory, up-to-date account for visitors, and the little that has been published is widely scattered in various periodicals. Several of the articles, like that of Dresser, for instance, cover an enormous territory, and the generalized statements cannot apply to a particular section, in the light of present knowledge. It took us nearly a month to find out what species had been definitely recorded in winter and what might reasonably be expected. The chief excuse for the present article, however, is the existence of two collections which have never been reported upon. The first is the Sennett Collection now in the American Museum of Natural History, consisting of some 3,500 skins, prepared by Frazar, Armstrong and Field, chiefly between 1878 and 1891. The second was made by Austin Paul Smith between 1908 and 1912. It consists of about 1,800 skins now in the Dwight Collection. Many records of rarities and extensions of ranges are based on these collections. The published literature has been combed for information supplementary to these collections, and it is hoped that comparatively little has been overlooked.

Our second reason for venturing to publish the results of work voluntarily undertaken, is the hope that it will serve to stimulate further investigation. The veriest tyro reading the list beyond will see that many species which are undoubtedly regular transients or visitants are omitted for lack of a definite record. Other wintering or transient species have been recorded from Corpus Christi, or from northeastern Mexico, which should be detected in our area. We know of at least two ornithologists who have never published the results of visits to this region. Further, Armstrong

[1] Abstract presented at the Meeting of the American Ornithologists' Union at Cambridge, Mass. on Oct. 11, 1923.

collected extensively for Salvin and Godman, but little besides the water-birds is listed in the later volumes of the 'Catalogue of Birds of the British Museum.' The status of many species is still in doubt, and discoveries of interest are certain to await the experienced student, even in a brief visit, no matter at what time of the year. A great mass of information undoubtedly exists in the collections of the Bureau of Biological Survey, and everyone interested in this region hopes to see Dr. Oberholser's great work on the birds of Texas published as soon as possible.

The area included has been restricted to the section south of the sand hills which run east and west a little north of Norias, the southern section of the great King Ranch, and perhaps seventy miles north of Brownsville. The Gulf of Mexico is, of course, the eastern boundary. Westward our region includes Lomita and Hidalgo up the Rio Grande, but further north stops at the open plains devoid of chaparral, which begin five or ten miles west of the railroad. It should be carefully noted that this area *excludes* the region about Corpus Christi, the northern half of the King Ranch, the northern half of Padre Island and the upper half of the Laguna Madre which contains some important bird islands. The region we discuss is, therefore, less than half that included in most of the papers on the birds of southern Texas, for which there are two main reasons, namely: the collections examined were made principally in the area selected; and the sand hills, already mentioned, form a natural boundary for the great majority of the tropical species.

The strategic position faunally of Brownsville is largely responsible for a list of 333 species and subspecies in an area where relatively so little observation has been carried on. Perhaps the most interesting element in the avifauna is the list of tropical species, most of which here reach their northern limit. The summer and permanent residents are chiefly Lower Austral, but there is a pronounced western or Sonoran element, which is equally apparent with transients and winter visitants. As a winter resort Brownsville is equally fortunate, one group of species barely extending so far north, another not found wintering further south. This accounts for the fact that the list of winter visitants is the largest of the seasonal groups. Finally the region is unexcelled

as a migratory highway, the routes of eastern, western and prairie species converging here with the narrowing of the continent, while a coast-line, running due north and south, and a great river valley probably serve as valuable land-marks. In no other way can we account for the number of western species occurring so far to the southeast, here recorded for the first time.

I. List of Essentially Tropical Species.

Mexican Grebe
Mexican Cormorant
Masked Duck
Black-bellied Tree Duck
Limpkin (acc.)
Mexican Jacana
Chachalaca
Red-billed Pigeon
White-fronted Dove
Sennett's White-tailed Hawk
Aplomado Falcon
Ferruginous Pygmy Owl
Groove-billed Ani
Texas Kingfisher
Merrill's Parauque
Rieffer's Hummingbird (acc.)
Buff-breasted Hummingbird
Couch's Kingbird
Derby Flycatcher
Mexican Crested Flycatcher
Beardless Flycatcher
Green Jay
Red-eyed Cowbird
Sennett's Oriole
Botteri's Sparrow
Texas Sparrow
Varied Bunting
Sharpe's Seed-eater
Gray-breasted Martin
Lesser Cliff Swallow
Yellow-green Vireo (acc.)
Small White-eyed Vireo
Sennett's Warbler
Rio Grande Yellow-throat

II. List of Essentially Western Species or Races attaining Approximately Easternmost Limits in this Region.

Cinnamon Teal
Treganza's Heron (casual)
Western Solitary Sandpiper
Chestnut-bellied Scaled Quail
Western Mourning Dove
Inca Dove
Western Redtail
Swainson's Hawk
Ferruginous Rough-leg
Desert Sparrow Hawk (cas.)
Western Horned Owl
Elf Owl
Road-runner
Texas Woodpecker
Golden-fronted Woodpecker
Texas Nighthawk
Arkansas Kingbird (cas.)
Ash-throated Flycatcher
Say's Phoebe
Western Wood Pewee
Vermilion Flycatcher
Bullock's Oriole
Brewer's Blackbird
Arkansas Goldfinch
Western Vesper Sparrow
Western Savannah Sparrow
Western Grasshopper Sparrow
Western Lark Sparrow
Gambel's Sparrow
Western Tree Sparrow (acc.)

Western Chipping Sparrow
Western Field Sparrow
Black-throated Sparrow
Cassin's Sparrow
Green-tailed Towhee
Texas Pyrrhuloxia
Western Tanager (cas.)
Cooper's Tanager (cas.)
Calaveras Warbler
Sonora Yellow Warbler (cas.)
Alaska Yellow Warbler (cas.)
Audubon's Warbler
Western Yellow-throat
Pileolated Warbler
Sage Thrasher
Curve-billed Thrasher
Cactus Wren
Verdin
Sierra Hermit Thrush

The following is a tentative summary of the seasonal variation in bird-life.

I. PERMANENT RESIDENTS. This group includes all species which can be found regularly throughout the year. Many are, however, in maximum numbers at one season of the year only.

Pied-billed Grebe
Laughing Gull
Gull-billed Tern
Caspian Tern
Forster's Tern
Least Tern
Water-Turkey
Mexican Cormorant
White Pelican (W)
Brown Pelican
Mottled Duck
White Ibis
White-faced Glossy Ibis
Least Bittern
Ward's Heron
Egret
Snowy Egret
Reddish Egret
Louisiana Heron
Little Blue Heron
Green Heron
Black-crowned Night Heron
Yellow-crowned Night Heron
Florida Gallinule
Coot
Black-necked Stilt
Willet
Long-billed Curlew
Killdeer
Texas Bob-white
Chestnut-bellied Scaled Quail
Rio Grande Wild Turkey
Chachalaca
Western Mourning Dove
White-fronted Dove
Mexican Ground Dove
Inca Dove
Turkey Vulture
Black Vulture
Cooper's Hawk
Harris' Hawk
Western Red-tail
Zone-tailed Hawk
Sennett's White-tailed Hawk
Aplomado Falcon
Audubon's Caracara
Barn Owl
Texas Barred Owl
Texas Screech Owl
Western Horned Owl
Elf Owl
Road-runner
Belted Kingfisher
Texas Kingfisher
Texas Woodpecker
Golden-fronted Woodpecker

Merrill's Parauque
Couch's Kingbird
Derby Flycatcher
Mexican Crested Flycatcher
Vermilion Flycatcher
Beardless Flycatcher
Texas Horned Lark
Green Jay
White-necked Raven
Red-eyed Cowbird
Vera Cruz Red-wing
Rio Grande Meadowlark
Western Meadowlark
Audubon's Oriole
Great-tailed Grackle
House Sparrow
Western Lark Sparrow
Black-throated Sparrow
Texas Sparrow
Gray-tailed Cardinal
Texas Pyrrhuloxia
Sharpe's Seed-eater
White-rumped Shrike
Small White-eyed Vireo
Western Mockingbird
Sennett's Thrasher
Curve-billed Thrasher
Cactus Wren
Lomita Wren
Texas Wren
Black-crested Titmouse
Verdin
Blue-gray Gnatcatcher
Bluebird

II. SUMMER RESIDENTS. This group includes a few species for which there are winter records, but which are not known to occur regularly at this season. It is possible that in time they will be transferred to the class of permanent residents. Others have never been found definitely nesting, but it is to be expected that they do so.

Mexican Grebe (W)
Royal Tern (P. R.?)
Cabot's Tern
Black Skimmer (P. R.?)
Black-bellied Tree Duck
Fulvous Tree Duck (P. R.?)
? Roseate Spoonbill (breeds?)
Purple Gallinule
Wilson's Plover
? Mexican Jacana
Red-billed Pigeon
White-winged Dove
Ferruginous Pygmy Owl
Groove-billed Ani
Yellow-billed Cuckoo
Western Nighthawk
Texas Nighthawk
Buff-bellied Hummingbird
Scissor-tailed Flycatcher
Ash-throated Flycatcher
Wood Pewee
Dwarf Cowbird
Sennett's Oriole
Orchard Oriole
Bullock's Oriole
Botteri's Sparrow
Cassin's Sparrow
Blue Grosbeak
Varied Bunting
Painted Bunting
Dickcissel
Summer Tanager
Purple Martin
Lesser Cliff Swallow
Sennett's Warbler
Rio Grande Yellow-throat
Yellow-breasted Chat

III. WINTER VISITANTS. This list does not include species whose occurrence at this season is believed to be purely casual, but does include others which undoubtedly belong in this group, in spite of the absence of a specimen taken in mid-winter. Many are very irregular in occurrence and are affected by the presence or absence of rain or "northers."

Herring Gull
Ring-billed Gull
Hooded Merganser
Mallard
Gadwall
Baldpate
Green-winged Teal
Blue-winged Teal
Cinnamon Teal
Shoveller
Pintail
Redhead
Canvasback
Scaup
Lesser Scaup
Ring-necked Duck
Bufflehead
Ruddy Duck
Snow Goose
Blue Goose
White-fronted Goose
Canada Goose
Hutchins' Goose
Whistling Swan
Bittern (no winter record)
Great Blue Heron (no winter record)
Whooping Crane
Sandhill Crane
King Rail
Sora
Wilson's Snipe
Long-billed Dowitcher
Red-backed Sandpiper (no winter record)
Semipalmated Sandpiper
Western Sandpiper
Least Sandpiper
Sanderling
Greater Yellowlegs
Lesser Yellowlegs
Western Willet
Spotted Sandpiper
Black-bellied Plover
Semipalmated Plover
Piping Plover (no winter record)
Mountain Plover
Ruddy Turnstone
White-tailed Kite
Marsh Hawk
Sharp-shinned Hawk
Red-tailed Hawk
Krider's Hawk
Texas Red-shouldered Hawk
Ferruginous Rough-leg
Duck Hawk
Pigeon Hawk
Richardson's Pigeon Hawk
Sparrow Hawk
Long-eared Owl
Short-eared Owl
Yellow-bellied Sapsucker
Northern Flicker
Red-shafted Flicker
Phoebe
Say's Phoebe
Cowbird
Yellow-headed Blackbird
Brewer's Blackbird
Goldfinch
Chestnut-collared Longspur
Western Vesper Sparrow
Savannah Sparrow
Western Savannah Sparrow
Western Grasshopper Sparrow
White-crowned Sparrow
Gambel's Sparrow

White-throated Sparrow
Western Chipping Sparrow (no winter record)
Field Sparrow
Western Field Sparrow
Song Sparrow
Lincoln's Sparrow
Swamp Sparrow
Green-tailed Towhee
Lark Bunting
Tree Swallow
Cedar Waxwing
Migrant Shrike
Solitary Vireo
White-eyed Vireo
Black and White Warbler
Nashville Warbler
Calaveras Warbler
Orange-crowned Warbler
Myrtle Warbler
Audubon's Warbler
Sycamore Warbler
Pine Warbler
Maryland Yellow-throat
Western Yellow-throat
Pipit
Sprague's Pipit
Sage Thrasher
Catbird
House Wren
Western House Wren
Prairie Marsh Wren
Ruby-crowned Kinglet
Hermit Thrush
Sierra Hermit Thrush
Robin

IV. TRANSIENT VISITANTS. This group contains those species which are not known either to winter or breed regularly.

Franklln's Gull
Black Tern
Wilson's Phalarope
Stilt Sandpiper
Pectoral Sandpiper
White-rumped Sandpiper
Baird's Sandpiper
Hudsonian Godwit
Marbled Godwit
Solitary Sandpiper
Upland Plover
Buff-breasted Sandpiper
Hudsonian Curlew
Eskimo Curlew
Golden Plover
Swallow-tailed Kite
Mississippi Kite
Swainson's Hawk
Broad-winged Hawk
Fish Hawk
Chuck-will's-widow
Whippoorwill
Nighthawk
Florida Nighthawk
Sennett's Nighthawk
Chimney Swift
Ruby-throated Hummingbird
Kingbird
Crested Flycatcher
Olive-sided Flycatcher
Western Wood Pewee
Yellow-bellied Flycatcher
Acadian Flycatcher
Traill's Flycatcher
Alder Flycatcher
Least Flycatcher
Baltimore Oriole
Clay-colored Sparrow
Rose-breasted Grosbeak
Indigo Bunting
Barn Swallow
Bank Swallow
Rough-winged Swallow
Red-eyed Vireo
Warbling Vireo
Bell's Vireo
Prothonotary Warbler
Blue-winged Warbler

Golden-winged Warbler
Tennessee Warbler
Northern Parula Warbler
Yellow Warbler
Magnolia Warbler
Cerulean Warbler
Chestnut-sided Warbler
Bay-breasted Warbler
Blackburnian Warbler
Black-throated Green Warbler
Northern Water-Thrush
Grinnell's Water-Thrush
Louisiana Water-Thrush
Mourning Warbler
Hooded Warbler
Wilson's Warbler
Canada Warbler
Redstart
Veery
Gray-cheeked Thrush

V. CASUAL OR ACCIDENTAL VISITANTS. Species here included have occurred on a very few occasions or only once, and would seem to be considerably out of their normal range or migration route. Some, however, may prove in the future to occur with greater regularity.

Old-squaw
Masked Duck
Treganza's Heron
Little Brown Crane
Limpkin
Western Solitary Sandpiper
Golden Eagle
Desert Sparrow Hawk
Red-bellied Woodpecker
Rieffer's Hummingbird
Arkansas Kingbird
Arkansas Goldfinch
Western Tree Sparrow
Western Tanager
Cooper's Tanager
Yellow-green Vireo
Sonora Yellow Warbler
Alaska Yellow Warbler
Pileolated Warbler

VI. OCCASIONAL VISITANTS. The two species given below have occurred at all seasons, but are not as yet known to be characteristic of any one of them.

Man-o'-war Bird
Wood Ibis

VII. OF UNCERTAIN STATUS. Most of the species in this group have been observed so seldom in this region, that their status cannot be determined without further research. There is no good reason for believing that any of them are accidental.

Common Tern
Avocet
Snowy Plover
Mexican Goshawk
Burrowing Owl
Texas Seaside Sparrow
Lark Sparrow
Gray-breasted Martin

The treatment and nomenclature used in this paper follow the 1910 'A. O. U. Check List,' but we have included subspecies which have been admitted in recent supplements. In certain cases we have ventured to comment on proposed subspecies, not yet acted upon by the Committee, when the material available for examination seemed sufficient to warrant the formulation of an opinion. It is a pleasure to acknowledge our great indebtedness to Dr. Jonathan Dwight for his kindness in permitting us to use the collections made by Smith. In addition we have greatly benefited by his determinations of this material. The Sennett Collection was checked by Waldron De Witt Miller, when it was received by the American Museum, and Dr. Harry C. Oberholser has examined some of the critical subspecies from time to time. In a region where so much original work remains to be done, we have thought it best to adopt an extremely conservative standard. No species is included on the basis of sight records or reports, and the status of no species is guessed at. While it may seem foolish to put a bird so easily identified as the Scarlet Tanager in the hypothetical list, we have the strongest reasons for excluding sight records of species which are even more striking in appearance, and have been equally drastic with our own field work. On the same principle we have not called a species a summer resident, no matter how strong the probability, unless we knew of a definite breeding record, adequately endorsed. It is our hope that this conservatism will aid future research, by calling attention to what are still open questions, and the personal element is thereby eliminated from criticism. Too little is known as yet about the avifauna of the Brownsville region for sight records and general statements to supplant the definite records based on judicious collecting, and we confidently expect that further investigation will alter many of the statements made beyond, even if the basis on which we made them cannot be seriously impugned.

(*To be continued.*)

GENERAL NOTES.

Black Tern at Brooklyn, N. Y. in Spring.—On May 16, 1925, at Dyker Heights, Brooklyn, N. Y., we had the pleasure of seeing a Black Tern in full spring plumage.

We found it flying back and forth over the swamp, sometimes close to the surface of an open bit of water, sometimes above the reeds. We got several good views of the bird and noted the main characteristics: the bluish-gray wings, dark body, etc.

This bird is, I believe, rare on the Atlantic coast in spring, only a few records having been made in this region at this season.

Dyker Heights swamp is a very good place for inland water birds; Gallinules, Grebes, Coots, Rails, various species of Sandpipers, etc. being of regular occurrence.—VICTOR ROSEN AND CHARLTON OGBURN, JR., *New York City.*

Black Skimmer on Lake Ontario.—A northern occurrence of a Black Skimmer (*Rynchops niger*), was reported to the Rochester Municipal Museum by William H. Bauer of Rochester who shot a male at Braddock's Bay along the Monroe county shore of Lake Ontario, September 15, 1924.

Mr. Bauer who was hunting along the shores of the lake reports that he saw a strange bird in a flock of Gulls on a sand bar. With it was another bird which he took to be the female, but a distance of 1000 feet and the presence of some 200 Gulls prevented close observation. Mr. Bauer and his friend Elmer Storer endeavored to shoot the strange pair but succeeded only in getting the male which he presented to the Rochester Municipal Museum. The bird seemed to be in perfect health and as lively as any of the Gulls and thus was not a sick or wounded stray. The wing spread is 42 inches.—ARTHUR C. PARKER, *Rochester Municipal Museum, Rochester, N. Y.*

Cinnamon Teal and Black Brant in Oklahoma.—The following species are not included in the bulletin on 'Birds of Oklahoma' by M. M. and L. B. Nice; and to the best of my knowledge they have not hitherto been recorded from this state.

Querquedula cyanoptera. CINNAMON TEAL.—The first specimen observed was brought in by a hunter in November, 1920. Another was secured the following year. They were both males.

Branta nigricans. BLACK BRANT.—A single specimen was identified in a flock of about fifty Canada Geese on April 2, 1922. It was feeding with them in a field of growing wheat.—WALTER E. LEWIS, *Gate, Oklahoma.*

Mallard Duck Nesting in a Tree.—In 'The Canadian Field Naturalist' (Vol. XXXIX, Feb. 1925, p. 44), Mr. A. D. Henderson notes the finding

of a Mallard nesting in an old Crow's nest near Belvedere Alta. Thinking that a similar Manitoba record might be of interest I am giving the following extract from my notes:—

On May 12, 1923, a few miles south of Birtle, Man. I saw a Mallard Duck fly from a Crow's nest built about twelve feet above the ground in a poplar tree. On climbing the tree I found that the nest was lined with down and contained eight Mallard eggs. The tree was in the center of a small clump of poplars, about twenty-five yards from a temporary slough and a hundred yards from a permanent one. On the same day I found a Blue-winged Teal's nest on the ground about twenty-five yards from the Mallard's. On May 17, I returned to photograph the Mallard's nest and found that the Teal's nest had been destroyed by Crows, but the Mallard's nest was unmolested..—R. D. Bird, *Dept. of Zoology, University of Manitoba, Winnipeg, Man.*

The White-winged Scoter in Louisiana.—I am unable to find a specific date for the occurrence of the White-winged Scoter (*Oidemia deglandi*) in Louisiana. The authorities at hand[1] mention the species as of rare occurrence, but no definite dates are given, and Mr. A. H. Howell writes me there are no records on file with the Biological Survey.

A young male of this species was sent to the Colorado Museum of Natural History by Mr. Lutcher Stark for identification. The bird was taken a few miles south of Cameron Farm in Cameron Parish, Louisiana, the latter part of December, 1924, by Mr. Elmer Bowman. The exact date was not obtainable. The specimen, in typical plumage of the young male, was mounted and returned to Mr. Stark at Orange, Texas.—Alfred M. Bailey, *Colorado Museum of Natural History, Denver, Colorado.*

Glossy Ibis in Colorado.—A specimen of this species (*Plegadis autumnalis*) was shot by a hunter at Russell Lakes (in the San Luis Valley), Colorado, during December, 1924. The bird had been seen more or less regularly in the neighborhood of the Lakes all Fall. The evidence on which this record has been based has been submitted to Dr. W. H. Bergtold who concurred in the diagnosis and recommends its publication, because this Ibis is very rare in Colorado.—Mrs. Jesse Stephenson, *Monte Vista, Colo.*

Black Vulture (Coragyps urubu) in Michigan.—On October 4, 1924, while driving along a country road near Tecumseh, Mich., I noticed a large black bird, evidently a Vulture, flying high overhead slowly wheeling and circling, rising then planing downward without apparent effort in the manner characteristic of these birds. Stopping the car I sprang out and fixing my field glasses on the individual I saw to my amazement that it was not a Turkey Vulture as I had thought, but a Black Vulture, a bird all but

[1] Beyer, Allison and Kopman, 'Auk' XXIV., Stanley Clisby Arthur—'The Birds of Louisiana.'

unknown in this State. While still watching the specimen two more came into view and one flew so low, directly over me, that I could see his rather chunky body outlined against the grayish white of the under wing surface, the black nakedness of the neck and head and even the white tip of the bill. The bird turned his head this way and that while circling over me at low altitude evidently trying to determine if the person below him was alive or dead, but finally drifted away in the direction his fellows had taken. The comparatively small size and the shortish tail which gave a decidedly chopped-off appearance to these Vultures, in addition to the other marks, made identification easy.

Barrows, in his 'Birds of Michigan,' places the Black Vulture in the hypothetical list, and I find no record of a visit of this species to this state but Butler, in his 'Birds of Indiana' (p. 769) mentions the fact that the range of the Black Vulture has been extending. Certainly three individuals of this species visited southern Michigan in the fall of 1924.—Etta S Wilson, *Detroit, Mich.*

Golden Eagle near Pensacola, Florida.—On January 23, 1925, a specimen of the Golden Eagle (*Aquila chrysaetos*) was taken at Walnut Hill, a small town about thirty-five miles northwest of Pensacola, and near the Alabama line. Upon examination and dissection it proved to be a young female. It is said to have been shot in the act of killing a kid, and the farmers of the region also accuse it of having killed and partly eaten eight or nine other kids during the preceding week. Other records for this species in Florida are noted in 'The Auk,' Vol. XXVII, 1910, pp. 80 and 206, and describe the capture of four specimens.—Francis M. Weston, Jr., *U. S. Naval Air Station, Pensacola, Fla.*

Osprey at Guelph, Ontario.—On September 28, 1924, Mr. R. E. Barber and I together saw an Osprey sailing through the air high above the waters of the little River Speed about half a mile east of the City of Guelph, and we could plainly see its great expanse of wings, white under parts, fuscous upper parts, fuscous banded tail, crest, and white and fuscous head, exactly like its pictures in the bird books. We observed it through 8-power prismatic field glasses, if indeed they were needed, as the big Fish Hawk came within 75 yards of us. We were standing on the edge of a cliff almost on a level with the Osprey. So far as we have been able to ascertain this is the first local record of the species for at least twelve years although about twenty years ago they are said to have been more plentiful.—Henry Howitt, *Guelph, Ontario.*

Behavior of the Barred Owl.—On April 6, 1925, a few miles from Princeton, N. J., the writer was fortunate to discover the nest of a Barred Owl. It was in a shallow hollow in the trunk of a hickory tree, in swampy woodland, about twenty feet above the ground. It contained two newly-hatched, downy young, lying prone on the floor of the cavity and

softly squeaking, and one egg, cracked across near the middle. The shells from which the young had come, were still in the nest. No pellets were to be seen anywhere near the nest. The only "signs" found were two tufts of downy feathers caught in the underbrush.

The brooding bird flew out when the writer was about fifty feet away, approaching from the side toward which the cavity opened. The ground was covered with dry leaves. It was not clear whether the bird was disturbed by the sound of foot-steps in the leaves, or looked out and saw some one coming. A test made later, suggests that the latter stimulus was the one to which the bird responded.

No sooner was the bird on the wing than a party of Crows, idling in the neighborhood, gave chase with all the choice expletives which are reserved for the big Owls. When perched in the midst of a cawing mob, the Owl would duck its head when one of the Crows made a dive at it, and would often counter by a thrust of the beak. When the Crows were quiet enough, the snapping of the Owl's beak could be plainly heard for 100 yards. The Owl did not make any visible attempt to use its feet as weapons. On two occasions it dived into a big hollow beech tree, leaving the watching mob outside. No doubt the Crows would have gone away in time, but in both cases the Owl came out again before they had dispersed. When perched in the open, the Owl's plan, if it had any, was to endure the pestering and profanity until the Crows one by one lost interest and drifted away; then by easy stages, approach, and finally disappear in the nest cavity. It did not approach its nest so long as a single Crow appeared to be watching. There was no loud talk near the nursery door. To test the sensitiveness of the bird while brooding, the writer approached from the side away from the cavity. The Owl did not come out until the tree was struck gently with the hand.—J. D. Carter, *Lansdowne, Pa.*

Barn Owls at Chicago, Ill.—Mr. Karl W. Kahmann, a Chicago taxidermist, reports that he has mounted about twenty Barn Owls this season. This is a greater number than he has handled in other years, the average being four or five. One party brought in five which were taken from a church steeple in Evanston; and said that the birds made so much noise that the neighbors could not sleep. I have always found this species rare here.—Henry K. Coale, *Highland Park, Ill.*

Unusual Nesting Site of Great Horned Owl.—On March 30, 1925, I heard that a "Booby Owl" had two young on top of hay in a mow about two miles from home. Fully expecting from the situation that I would find Barn Owls I visited this barrack next morning and found two young *Bubo v. virginianus*, about half nest grown.

A hay-barrack as here built has a stone foundation usually a foot or more above ground where ground is highest to keep the sills up from dampness. The frame goes up sixteen feet to the plate, and is then weatherboarded on each end and for one third along the sides, leaving the center third on

each side open so a hay wagon can drive through. The roof runs from end to end and is shingled and the gable ends weatherboarded. As hay was plentiful last year this barrack was filled, the hay being pushed in under the roof completely up to the peak and then the center third was filled up as high as it could be pushed under the eaves. One of the short gable boards however, had come loose and fallen off leaving an eight inch space from the peak of roof to the plate. In settling, the hay left a space of about three feet under the roof, and on the highest part of this I found the young, huddled close together with no attempt at a nest, and beside them half of a rabbit, which had been there the day before (10 A. M.) when my informant found them. They were about two feet in from the weatherboarding opposite where the board was off, which afforded entrance for the old birds.

The barrack stands out in the open, no trees near it, and about halfway from the orchard to the woods which are about one-third of a mile apart. The situation was unusual also as the young were not over twenty four feet above ground all the previous nests I had seen being high up in large trees, and nearly all in Red-tailed Hawks nests of the previous year, and more or less in the center of a piece of woods.

Mr. Nicholas Parker who owns this farm assured me that if he could prevent it, the Owls would not be disturbed until they saw fit to move out. Under the eaves of his barn are still the nests of the Eaves Swallows mentioned in the April, 1925, 'Auk' as being found there last year. The farm is about twenty miles from the centre of Baltimore city, and slightly east of due north in an air line.—Frank C. Kirkwood, *R. 3, Monkton, Baltimore Co., Md.*

Strange Behavior of Great Horned Owl in Behalf Of Young.—While observing bird life March 21, 1925, near Church Creek, Md., a nest of the Great Horned Owl (*Bubo virginianus virginianus*) containing three half-grown young was found. The nest was an old one of the Red-tailed Hawk placed in the crotch of a pine about fifty feet up and quite exposed. As I was climbing the tree to examine the young, which were visible from the ground, I heard short wailing notes to one side and arising apparently from the ground. The notes were unknown to me and I was at a loss to identify the author. When about thirty-five feet up, I was surprised to see one of the Owls half running and fluttering some fifty yards away on the floor of the woods with wings outstretched and uttering the notes that I heard a few moments before. Occasionally the bird would stop, beating first one wing and then the other, as though wounded. Twice the bird left the ground perching in the tops of nearby trees and then the well known "hoot" was heard, which is the usual form of protestation. In each instance, after a few moments' inspection, the bird returned to the ground and continued the fluttering actions which lasted while I was in the vicinity of the nest.—Ralph W. Jackson, *Route No. 1, Cambridge, Md.*

Protective Coloration of Horned Larks.—On February 7, 1925, in an open field in Guelph township, Ontario, about 55 miles north of Lake Erie, and 47 miles west of Toronto, I saw five Prairie Horned Larks (*O. a. praticola*), my first for the year. They were walking slowly about in some manure which had been scattered lightly over the field, and I was standing on a road adjoining the field and was watching the Larks through 8-power Busch prismatic field-glasses. Suddenly I heard a whistling of wings overhead, looked up, and saw a Sharp-shinned Hawk fly into a tree the foot of which was about 20 or 25 yards from the Larks. The Hawk perched on a branch about 25 or 30 feet up the tree. After the arrival of the Hawk I could no longer distinguish the Larks, although I searched the ground carefully in all directions with my glasses. Nor, apparently, could the Hawk see them, for after waiting about five minutes it flew on to another tree about 150 or 200 yards distant and perched about 25 or 30 feet up for about five minutes. Still the Larks remained indistinguishable during another careful search. About five minutes after the Hawk left the second tree the Larks flew from the exact spot where I had last seen them, singing as they flew, over the place where I was standing, in the direction whence the Hawk had come, and in the exactly opposite direction to that in which it had gone.—HENRY HOWITT, *Guelph, Ontario.*

Another Record for the Genus Corvus in St. Croix.[1]—In the Proceedings of the U. S. National Museum, vol. 54, Nov. 21, 1918, pp. 521–522, the writer recorded *Corvus leucognaphalus* from the Island of St. Croix, Virgin Islands, on basis of bones collected by Theodoor DeBooy from a kitchen midden near the mouth of Salt River on the north coast. It is of interest to record two broken bits of humeri of this same species in material secured from midden deposits on the Richmond estate, near Christiansted, St. Croix, presented to the U. S. National Museum in 1924, by Mrs. Hugo Hark. It may appear that the Crow was formerly of regular occurrence on St. Croix though not recorded in modern times in the living state east of the Island of Porto Rico.

From these same deposits near Christiansted come leg bones of the extinct rail *Nesotrochis debooyi* Wetmore, associated with a few fragments of *Casmerodius alba, Buteo borealis, Pandion haliaetus, Zenaida zenaida* and *Gallus gallus.* The last named is possible indication that the deposits in question may not be particularly old.—ALEXANDER WETMORE, *U. S. National Museum, Washington, D. C.*

The Starling at Guelph, Ontario.—My friend, Mr. R. E. Barber of Guelph, a reliable ornithologist of many years' experience, told me recently that in the spring of 1924 he saw a pair of Starlings which had nested and reared a brood in the hole of some Northern Flickers in the dead top of a tree on the lawn of Mr. Halliday on the outskirts of Guelph. It is

[1] Published by permission of the Secretary of the Smithsonian Institution.

said by Mr. Halliday, who is a taxidermist, that the Starlings were followed later by the returning Flickers who found themselves dispossessed and fought to regain their home, but were unable to oust the Starlings. Am confident this is the first record of Starlings in this locality.—HENRY HOWITT, *Guelph, Ontario.*

The Starling (Sturnus vulgaris) at Leetonia, Ohio.—Some time during the previous year (I cannot recall the exact date) I had occasion to enter a barn out in the country near here. In the uppermost part of the barn in each end there was a window and every morning I noticed a strange looking bird flying around there. It gained entrance under the roof for the purpose of roosting overnight, I suppose, and then it became confused and was unable to find the exit. In its efforts to regain its freedom it flew from one window to another with considerable force. When I went out I left the door ajar and thus allowed it to escape. Every morning during the ensuing week this program was repeated. Finally, I decided to try to determine the species. I climbed to the window where it was sitting and captured it. On consulting Reed's 'Bird Guide' I identified it as a Starling, (*Sturnus vulgaris*). In the neighborhood of my home I have recently noticed large flocks of Starlings. The previous year only a few roosted in a certain place but now they congregate in flocks of several hundred. They seem to be increasing as rapidly as did the English Sparrow (*Passer domesticus*). The largest number I have observed in a single flock would be about fifty.—LONY B. STRABALA, *Leetonia, Ohio.*

Mountain Song Sparrow in Oklahoma.—A specimen of *Melospiza melodia montana* (formerly *fallax*) has recently been identified for me by Dr. H. C. Oberholser. This bird was collected by me in Canadian County, Oklahoma, Dec. 25, 1913; it is now in the Museum of the University of Oklahoma, This constitutes the first record for this subspecies from the state.—E. D. CRABB, *Ann Arbor, Mich.*

Winter Habits of the White-throated Sparrow at Chapel Hill, North Carolina.—During the winter months of 1923–24 a flock of some thirty or more White-throated Sparrows (*Zonotrichia albicollis*) could always be found in the neighborhood of a small wooded ravine near our house. The ravine was perhaps two hundred and fifty yards long and one hundred yards wide and through it flowed a small brook bordered by elms and willows. The slopes of this little valley, with the exception of several weed grown fields, were covered with small bushes, a few scattered cedars and deciduous trees, and thick tangles of honeysuckle vines. From this sheltered haven the White-throats made frequent excursions to the lawns and shrubbery surrounding the houses on the west side of the ravine. On winter mornings it was cheery to hear a few somewhat subdued notes of their sweet and plaintive song. Towards spring the notes became richer and the entire song was given much more frequently.

The feathered folk always found plenty of bread crumbs, and sometimes suet, waiting for them. The White-throated Sparrows, Cardinals, Catbirds, Slate-colored Juncos, and Carolina Wrens were daily visitors and occasionally Myrtle Warblers and Brown Thrashers came with them. The White-throats, with almost clock-like regularity, visited our feeding station twice daily, just after daybreak and again in the early evening during the hour before dusk. Often they appeared at other hours during the day but never with the regularity of their morning and evening visits. At times as many as fifteen or twenty individuals could be counted at once but it was almost impossible to estimate the number in the flock. They straggled from the ravine, five or six at a time, searched industriously for food for a few minutes and then left, their places being taken by new comers, and consequently we never saw all of them at any one time. It is interesting that these White-throats seemed to follow a regular route, nearly always coming in from the southern end of the valley and, when they left, going towards the north.

In order to get more definite information about the White-throats and to find out whether the group was composed of the same individuals from month to month we decided to trap and band as many as possible. A home-made model of the U. S. Government Sparrow trap was used. The trap was located about twenty feet from the house near a stone wall sheltered by small bushes. We could watch all that went on, from a window, and be unobserved ourselves. At first the White-throats were slow to find the trap and shy and hesitant about entering, but later, after they had learned that there was always an abundance of food within, they entered more readily. Sometimes a bird would enter the trap and, after feeding quietly for several minutes, would casually find its way out, apparently never realizing that its freedom had been endangered. As soon as a bird became conscious of being a captive it was invariably panic stricken, fluttered wildly about, and then was seldom able to find the narrow opening through which it had entered. We always removed and banded a bird as soon as we found that one had been trapped so that it should not remain in the trap a needlessly long time. Occasionally, after the hand was opened to release it, the bird did not seem to know that it was free and lay motionless on its back. Seconds passed, perhaps a minute, then like a flash the bird would dart to the nearest tree, ruffle its disarranged plumage utter an indignant chirp, and fly away.

We discovered, as others have, that the birds in their struggles to escape from the trap pushed their beaks through the meshes of the wire and scraped the surfaces of the mandibles. When this happened it was always noted on the record card. No. 129,774, banded on April 16 had not only injured the upper mandible but had also scraped the feathers and skin from the forehead above the bill. This bird was taken again on April 22 and at that time was apparently suffering no ill effects from its previous injury.

The following is a list of individuals which were banded and which repeated at a subsequent date.

No. 122,796	banded	Jan. 7, 1924	repeated	Jan. 21 and Feb. 19, 1924.
" 122,799	"	Jan. 16, 1924	"	Feb. 19, 1924.
" 122,800	"	Jan. 16, 1924	"	Jan. 20 and Feb. 25, 1924.
" 122,802	"	Jan. 19, 1924	"	April 23, 1924.
" 122,803	"	Jan. 20, 1924	"	Feb. 22, 1924.
" 122,805	"	Jan. 22, 1924	"	March 10, 1924.
" 122,809	"	Feb. 7, 1924	"	Feb. 18, 1924.
" 122,810	"	Feb. 19, 1924	"	April 11 1924.
" 122,811	"	Feb. 22, 1924	"	Feb. 24, 1924.
" 122,821	"	March 3, 1924	"	April 28, 1924.
" 122,822	"	March 4, 1924	"	March 10, 1924.
" 129,772	"	March 26, 1924	"	April 2, 1924.
" 129,774	"	April 16, 1924	"	April 22, 1924.

In addition to the above we banded 26 White-throats which were never taken a second time. The first White-throat of the season was seen on October 14, 1923; the last one recorded in the spring was on May 3. These records indicate that this was a "neighborhood" group of White-throated Sparrows, such as Baldwin has described ('The Auk,' Vol. XXXVIII, April, 1921) and that some, and possibly all, of the individuals composing this group remained in this comparatively limited area all winter. Very often we saw individuals at our feeding station with a shiny band on one leg and, since we had never taken a White-throat which had been banded at another station, we felt fairly safe in assuming that we had banded these birds. If we had had more time to devote to trapping we would doubtless have secured more returns and our data would be more conclusive.—THELMA R. PERINE AND KEBLE B. PERINE, *Berkeley, California.*

Vireo bellii bellii at Detroit, Michigan.—In 'The Auk,' XLII, 1925, p. 277, Mr. Josselyn Van Tyne records an adult female of *Vireo bellii bellii* that he found in the William Brewster collection, now in the Museum of Comparative Zoology, Cambridge, Massachusetts. This specimen was obtained by Mr. Brewster from Charles K. Worthen, and bears the latter's label, Detroit, Michigan, May 26, 1885. No collector is given. This apparently adds this species to the list of the birds of the state. We have recently examined this specimen and feel certain that a mistake in locality has occurred. Mr. Worthen always removed the collector's label and substituted one of his own, and it is highly probable that in making this substitution an error in locality was made. We are aware of no one that made bird skins in Detroit, Michigan, in 1885. Again, it is very improbable that Mr. Brewster would have failed to record this specimen, as he was extremely acute in placing on record the birds of the United States that came into his hands. Mr. Brewster was perfectly familiar with Bell's Vireo in life from his visit with Mr. Ridgway at Wheatland, in southwestern Indiana.

Under the circumstances it seems to us that Bell's Vireo should not be

added to the avifauna of Michigan on the strength of this specimen.—Bradshaw H. Swales and Norman A. Wood, *U. S. National Museum, University of Michigan.*

The Status of Amoromyza Richmond.—In the 'Bulletin of the British Ornithologists' Club,' Vol. 45, April 25, 1925, p. 93, Mr. Gregory M. Mathews, has proposed a generic name *Gummyza*, with *Merops samoensis* Hombron and Jacquinot as type. Though the species *samoensis* appears generically distinct from related forms, cognizance of this was taken by Richmond (Proc. U. S. Nat. Mus., Vol. 53, Aug. 16, 1917, p. 593) when in a discussion of *Gymnomyza* Reichenow, he erected the genus *Amoromyza* with *Merops samoensis* Hombron and Jacquinot as type. *Gummyza* Mathews, 1925, therefore, is a synonym of *Amoromyza* Richmond, 1917.—Alexander Wetmore, *U. S. National Museum.*

The Cape May Warbler at Chapel Hill, North Carolina.—On May 6, 1924, I had the good fortune to see two Cape May Warblers (*Dendroica tigrina*), one in the bright plumage of the adult male, the other a much duller colored individual which was either a female or an immature male, probably the former. My attention was first attracted to the birds by an unfamiliar song, a high pitched, chittering ditty, resembling in its quality of tone the song of the Blackpoll Warbler, but with more variation in tune. The birds were in a cedar tree in bright sunlight, not more than twenty feet away, and I had ample opportunity to study them with binoculars. They appeared to be nervous, quick moving little creatures. The rufous colored ear coverts and the white patches on the wing coverts are conspicuous field marks.

From September, 1922 until September, 1924, with the exception of the summer of 1923, I was in Chapel Hill. During this period I made frequent field excursions and this was the only time that I saw a Cape May Warbler. Apparently this Warbler is an uncommon spring transient, at least in the central part of North Carolina. T. G. Pearson, C. S. Brimley, and H H. Brimley ('Birds of North Carolina,' 1918.) report the Cape May Warbler as tolerably common at Chapel Hill, April 26 to May 3, 1909. They also state that this Warbler has been taken at Raleigh in the spring in the years 1892, 1909, and 1915, and further note that it has been recorded in spring between April 22 and May 15 from six mountain localities. in the western part of the state. They give only two fall records for the state.—Keble B. Perine, *Berkeley, California.*

Some Notes on the Connecticut Warbler (Oporornis agilis) from Luce County, Michigan—July 23, 1922 is the first date of my finding *Oporornis agilis*. I was in a piece of ground that was covered by forest fire after the lumberman had cut the timber off. Much of this fire-covered ground has grown up to raspberry, and blackberry bushes, where it did not grow up to brush at once. In some places of course both grow at the

same time, the small berry bushes eventually being crowded out. It was in one of these places where raspberry bushes were commonly found that the first Connecticut Warbler that I saw was located. It was perhaps on the ground when I came near, as it flew on a berry bush, gave a few notes ("peenk"), and disappeared again among the bushes.

In the year 1923, the only one I saw, was on Aug. 18. It was about four rods north of where I found it in 1922.

In the year 1924, the first that I saw, was on Aug. 22, a pair being found about 60 rods due south of the 1922 locality, and in the same type of ground. A single male bird was seen on Sept. 1 and 16.

The white eye-ring, was the chief identification mark between this species and the Mourning Warbler (*Oporornis philadelphia*) which has no eye-ring.—Oscar M. Bryens, *McMillan, Luce County, Michigan.*

A Retrograde Movement in the Connecticut Valley.—A retrograde movement in the migration of birds is an infrequent occurrence, difficult to detect and observe. We had an example of one in the Connecticut Valley, April 21, 22, 23, 1925.

Spring came earlier than usual this year and, as a result many of the harbingers and initial flocks of Robins, Blackbirds, Bluebirds, Song and Fox Sparrows passed up the Valley during March. The snow, with the exception of shaded gullies in woodlands, had vanished in Massachusetts as the month came to a close. To all appearances spring had fully set in by mid-April, but winter would not be downed without one more fling! On April 19 and 20 a storm swept across central New England, leaving in its wake a blanket of snow from three to eighteen inches in depth and accompanied by low temperatures. At Woodsville, Vt., and along the northern portions of the Valley fourteen inches of snow was reported.

Such storms bring extreme suffering to the early birds. Many unquestionably die. The majority retreat and we find favorable sheltered spots harboring birds that had passed through our vicinity several weeks previously. With the melting of the snow, which lasts usually but a day or two, the birds about face and resume their northward course.

Early in the morning of April 23, I visited the Island in the Connecticut River at Holyoke. On the way I noted flocks of Robins feeding about several lawns. Approaching the Island my ear caught a babel of bird voices, interspersed with songs, chiefly of the Red-winged Blackbird. For the most part, the birds were in the tree-tops—feeding on the catkins (*Salix fragilis*) and mingled with them were several smaller flocks of Rusty Blackbirds. Cowbirds were unusually numerous. There were very few female Redwings but the flocks of Rusties were evenly divided and some of the males were breaking into subdued song, with notes now and then reminiscent of the Bobolink.

At intervals a flock of from six to eight Redwings would launch out into the air, heading straight up the Valley. While watching one such

group, I discovered another flock very much higher, swiftly winging their way northward—Blackbirds possibly that had retreated to Connecticut.

That same afternoon while visiting the Duck Hawks on Mt. Tom, we found more than a dozen Hermit Thrushes in the lee of the southeastern shoulder. Overhead an Osprey and Red-tailed Hawk pursued a direct course northward.

We felt it was strange we failed to find any Fox Sparrows. In talking since with an observer, I learned that they were seen at the time of the storm in numbers at Greenfield, thirty miles north of Holyoke.—AARON C. BAGG, *70 Fairfield Ave., Holyoke, Mass.*

New and Rare Birds for North Dakota.—The following important records have recently come to my attention. All except the Pigeon Hawk are now in the Milwaukee Public Museum and with the exception of the Whooping Crane were collected by C. Akley.

Chen caerulescens. BLUE GOOSE.—Female. Foster Co., N. Dak., September 26, 1890.

Grus americanus. WHOOPING CRANE.—Female, Lake Benton, N. Dak., November 9, 1901. Collected by J. Killsley.

Grus canadensis. LITTLE BROWN CRANE.—Male and female, Foster Co., N. Dak., October 4 and 5, 1890.

Grus mexicana. SANDHILL CRANE.—Male and female, Foster Co., N. Dak., October 2, 1890.

Falco mexicanus. PRAIRIE FALCON.—Immature female, Foster Co., N. Dak., October 8, 1890, male same locality, December 6, 1891.

Falco peregrinus anatum. DUCK HAWK.—Immature male, Foster Co., N. Dak., September 26, 1890.

Falco r. rusticolus. GRAY GYRFALCON.—Mandon, N. Dak., 1887.

Falco c. columbarius. PIGEON HAWK.—Adult male and set of three eggs. May 13, 1924, collected by G. F. Abbey near Columbus, Burke Co., N. Dak., now in the museum of the University of Michigan.—N. A. WOOD, *Museum, University of Michigan, Ann Arbor, Mich.*

One Additional Copper-plate of the Folio edition of Audubon's 'Birds of America.' In the April issue of 'The Auk' (p. 282, XLII, 1925), I recorded a plate not on my previous lists. Since then I have been informed by Dr. John B. May that there is a plate in the Pratt Memorial Library of Cohasset, Mass., representing the Swallow-tailed Hawk (plate LXXII). It was presented to the library by Mrs. Samuel T. Snow, whose husband was connected with the Revere Copper Co., of Boston. It is presumed that it was presented to Mr. Snow by Mr. Charles A. Cowles of Ansonia, Conn. about 1895. Mr. Cowles was instrumental in saving a number of these plates which had been sent to the Ansonia Brass and Copper Co. to be converted into copper bars.

This brings the list up to 41 of which 23 are deposited in Museums, Universities and Public Libraries.—RUTHVEN DEANE, *Chicago, Ill.*

RECENT LITERATURE.

Brewster's 'Birds of the Lake Umbagog Region of Maine.'—The second part of this posthumous work[1] of the late William Brewster is before us and it carries on the admirable series of sketches through the shore birds, gallinaceous birds and birds of prey, following the order of the A. O. U. 'Check-List.' This part, referring as it does to birds of unusual interest, commands at once the attention of both the technical ornithologist and the layman, while Mr. Brewster's accuracy of observation combined with his painstaking care in composition makes the 'Birds of Umbagog' one of the best series of ornithological biographies that has yet appeared.

The account of the habits of the Ruffed Grouse full of direct extracts from the author's diary is particularly interesting, especially the details of its method of drumming and the conversion of his guides from their previous ideas, that the sound was produced by beating the wings on the log or on the breast of the bird, to his view that it was caused by beating on the air alone. The opinion too that the "budding" of fruit trees by the Grouse prevents overbearing and makes for an annual crop of apples instead of a biennial one, is well worthy of the serious attention of the economist as another illustration of nature's methods of conservation upon which man is ever trying to improve.

The record of the occurrence of Wild Pigeons at the Lake from 1870 to 1882, when Mr. Brewster saw his last individual, is one of the few careful records of the final stage in the disappearance of this noble bird.

The accounts of the Hawks, Eagles and Owls, birds which have attracted much attention of late years, are replete with interesting and important observations.

Beside the pleasure that one derives from reading the pages of the 'Birds of Umbagog' we are impressed with the fact that the work is bound to become one of the most important and reliable works of reference on the life histories and activities of the birds of eastern North America, a field that is yearly absorbing the attention of more and more of our ornithologists.

As plumage variations and geographic distribution become completed studies in this area we are naturally concerning ourselves more with the detailed activities of birds, from which studies we evolve characters of action, if we may so term them, for each species quite as distinctive as color or structural characters, and we naturally would fain compare our observations and conclusions with those of others. No loose and slipshod or second-hand notes will serve for such purpose and it will be upon works like this of Mr. Brewster that we shall place our reliance.—W. S.

[1] **The Birds of the Lake Umbagog Region of Maine. By William Brewster. Bull. Mus. Comp. Zool. Vol. LXVI. Part 2. Cambridge, Mass. February 1925. pp. 213–402. Price $1.50.**

Jack Miner and the Birds.—Probaby everyone interested in wild fowl has heard of Jack Miner, former hunter and market gunner, who more recently has become famous by attracting migrant Canada Geese to his pond at Kingsville, Ontario, and has obtained notable results in bird banding of Ducks and Geese.

In 1923 he published in book form the account of his methods with the Geese and a brief review of his life and his interest in wild fowl and song birds, and we now have before us an American edition[1] of this work which was originally privately published in Canada. The little volume makes no pretense to literary style but tells the story of its author's work in his own way and in his own words.

We learn that in 1904 he conceived the idea of making the passing Geese come to rest at his home by constructing a pond in which he kept a few wing-clipped Canada Geese which were fed regularly. It was four years before any of the migrating birds decoyed to the pond but in 1908 eleven stopped, next year 32 and since then large numbers yearly pause at Jack Miner's pond on their flights and here they are fed and protected and become almost as tame as domestic Geese to the delight of numbers of visitors who come there to see them.

Many of the Geese are now trapped in a pen every year and banded and Ducks hatched from wild Duck's eggs and reared by Miner are similarly marked before they depart for the South. These have in time brought many returns and put Jack Miner in communication with persons in all parts of the country. Most of the south-bound Geese that he has heard from are shot in North Carolina and Virginia while all of the north-bound birds go to the shores of Hudson Bay, but the Duck records are much more widely spread and returns are recorded from all of the States from Louisiana to the Dakotas and from Florida to New York as well as west to Alberta.

There are many things in this little volume besides the Duck and Geese studies to interest the bird student and conservationist. There are accounts of the Bobwhite, Pheasant, Robin, Bluebird, Swallow family and Woodpeckers, giving the author's views on their protection and value, and chapters on the natural enemies of birds, Wild Duck hunting etc. The book is well printed and illustrated by numerous half-tones from photographs.

Jack Miner's story makes interesting reading and is at the same time a valuable contribution to our knowledge of water fowl and the possibilities of attracting wild birds.—W. S.

Mathews' 'The Birds of Australia.'—This great work is now rapidly approaching completion and since our last notice two parts[2] have appeared nearly completing the Honey-eaters and leaving only about fifty species to be treated. A new race of *Myzantha obscura*, *M. o. perplexa*

[1] **Jack Miner and the Birds and Some Things I Know About Nature. By Jack Miner. Chicago. The Riley & Lee Co. 1925, pp. 1–176. Price $2.50.**

[2] **The Birds of Australia. By Gregory M. Mathews. XII, pt. 1, March 3; pt. 2, May 11, 1925.**

is described from Victoria (p. 50) and in the list of races "Victoria" in inadvertently given as the author of the name!

On April 6, 1925, there was also published the first part of a 'Bibliography of Australian Birds' of which another part will follow. This like the 'Check List' is uniform with the large work and is regarded as a part of it. The introduction consists of biographical sketches with portraits of Charles Davies Sherborn and Charles Wallace Richmond two of the leading figures in ornithological bibliography to whom the author has been under continued obligations.

The bibliography itself, covering the letters A–N, is wonderfully full of historical and biographical data, exact dates of publication etc. etc., and constitutes one of the most important portions of this work from the standpoint of the general ornithologist, as many of the publications listed and described deal with birds of other parts of the world beside Australia. So valuable to the systematic worker will this 'Bibliography' prove that it is to be hoped that, in the interest of science, arrangements will be made by which it may be obtained separately. In any event, we are under a debt of gratitude to Mr. Mathews for working out all the information which it contains and publishing it.—W. S.

Balsac on the Ornithology of the Northern Sahara.—M. H. Heim de Balsac, who has been publishing in the 'Revue Francaise de Ornithologie' an account of his expedition into the northern portion of the Sahara, has now issued the several installments in book form, rearranged and repaged, forming a very valuable contribution to our knowledge of the birds of north Africa. His route lay from Sfax through Maknassy and Gafsa to Tozeur, in Tunis, and from Ghardaia north to Algiers, in Algeria. The annotations are full with measurements of important specimens and French vernaculars for each species, while the introduction contains many observations on the fauna and flora of the region.—W. S.

Townsend's 'Sand Dunes and Salt Marshes.'—Dr. Charles Wendel Townsend has published a new edition of his 'Sand Dunes and Saltl Marshes,'[1] a series of delightful sketches of the natural history of the Massachusetts coast already reviewed in 'The Auk' for 1913 (p. 593).

The present volume seems to differ in no respect from the original except in the use of heavier text paper and the addition of a short introduction by Ralph Hoffman. Dr. Townsend has delighted many nature lovers with his writings and the present attractive edition of this earlier work will be welcome to those who possess his later publications.—W. S.

Skinner's 'Birds of the Yellowstone National Park.'—This admirable work[2] published as one of the Roosevelt Wild Life Bulletins of

[1] Sand Dunes and Salt Marshes. By Charles Wendell Townsend. L. C. Page & Company, 53 Beacon St., Boston, Mass. Large 12 mo illustrated with numerous half-tones from photographs. $3.50.

[2] The Birds of Yellowstone National Park. By Milton P. Skinner. Roosevelt Wild Life Bulletin of the Roosevelt Wild Life Forest Experiment Station, Syracuse, N. Y. Volume 3, No. 1. February, 1925, pp. 1–192. Price $1.00.

the Roosevelt Experiment Station is unique in several respects. There is no lengthy annotated list, but a series of chapters describing the bird life of various sections of the Park, as one takes a typical trip through it, from Gardiner to Mammoth Hot Springs, Yellowstone Lake and the Grand Canyon followed by sketches of the bird life of the various characteristic environments'—the forests, open country, brooks and rivers etc., with special consideration of the Mallards, the White Pelicans and the Trumpeter Swans of the Yellowstone. Finally there is a key for field identification and a nominal list of the birds of the Park, with English and technical names, a bibliography and two maps.

There are many half-tone illustrations from photographs by the author and others and four colored plates from paintings by E. J. Sawyer, representing groups of birds of the forests; Yellowstone Lake; open country and wooded streams. These are similar in character to those furnished by the same artist for earlier bulletins and are equally well done.

With regard to the Trumpeter Swans we learn that Mr. Skinner has seen them on eight occasions during the years 1915–1921 from one to five individuals on each occasion. Of the Pelicans, he writes that about 700 are present for an average of ninety-six days each season, the date of arrival varying from April 28 to May 23, while that of departure ranges from September 5 to 7. The winter home of these Pelicans is not definitely known and the bird banders have here an interesting opportunity!

Mr. Skinner is to be congratulated upon an admirable piece of work especially well adapted to the needs of visitors to the Park who should make sure to obtain a copy of the report while it is at the same time an excellent work of reference for the ornithologist engaged on faunal work or on the life history of individual species.—W. S.

Aves in the Zoological Record.—Mr. W. L. Sclater has again performed the arduous task of compiling the list of ornithological papers and new species for the 'Zoological Record' for 1923. This publication is absolutely essential to the working ornithologist who must know what has been published each year and what new species have been described or his work will be likely to prove useless and confusing duplication.

It is therefore a very serious matter for all zoologists when the Zoological Record is threatened, as it now is, with suspension owing to the inability of the Zoological Society of London to longer meet the increasing expense of its publication. Recently other institutions and individuals have in some measure come to its assistance but it is absoulutely necessary that this support be continued in greater measure. It would seem that there are many members of the A. O. U. who could well afford to purchase the 'Aves' section. The publication[1] would amply repay them in giving a

[1] Aves. Zoological Record. Vol. LX, 1923. By W. L. Sclater, M. A. Printed for the Zoological Society of London. Sold at their House in Regent's Park, London. N. W., 8., pp. 1–75. Price, 7 shillings and 6 pence. December, 1924.

clearer idea of the extent of the ornithological literature of the world while there would be the satisfaction of knowing that they were helping to make the progress of scientific ornithology possible.

Mr. Sclater has listed no less than 1027 titles for the year 1923, all of which are arranged alphabetically by authors and again classified under the various special topics of which they treat and the countries whose bird life they discuss. Then there are the names of all new species and subspecies, reviews of groups and special notes on particular birds, all arranged systematically so that one may, at a glance, obtain references to all that has appeared relative to any branch of ornithology or the birds of any family or country. Mr. Sclater has again placed all ornithologists in his debt for his careful and conscientious work. (see further p. 483 seq.)—W. S.

Stoner's Sketch of the Life of Audubon.—The University of Iowa has issued an 'Extension Bulletin' on the life of Audubon[1] which in a supplementary sheet is credited to Prof. Dayton Stoner. It would perhaps have been better had the authorship remained anonymous since the sketch is full of errors,—a particularly unfortunate fact in view of the educational character of the publication. The writer was apparently quite ignorant of Prof. Herrick's 'Life of Audubon' which corrected so many of the misstatements of earlier biographies (see 'Auk,' January 1918) and has taken his data from one of the latter, so that we find both the date and place of Audubon's birth erroneously stated and other errors regarding his early life. But in addition to this, the facts of his life are so badly garbled that it is difficult to understand how the sketch could have been prepared. To cite a few of the errors Audubon is credited with securing 300 subscribers to his work in 1824, before ever going to England, while as a matter of fact he had not then published a single plate nor definitely decided to publish, his first subscribers were obtained abroad and it is doubtful if he had as many as 300 all told. The ornithologist Charles Bonaparte is referred to as "Joseph Bonaparte" and the title of the 'Birds of America' is constantly misquoted. We trust that the publication in the interests of accuracy may be withdrawn from circulation.—W. S.

Kirke Swann on the Birds of Prey.[2]—The third part of Kirke Swann's 'Monograph of the Birds of Prey' is fully up to the standard of its predecessors. It covers the remaining species of *Circus*, the genera *Micrastur*, *Clamosocircus* (p. 145, new name for *Climacocircus* Cab. preoccupied), *Geranospiza*, *Urotriorchis*, *Parabuteo*, *Melierax* and begins the great genus *Astur*.

Besides the excellent synonymy and technical discussion under each

[1] Stoner's 'Life of John James Audubon' University of Iowa Extension Bulletin No. 116. January 15, 1925, pp. 1–10.

[2] A Monograph of the Birds of Prey. By H. Kirke Swann, London, Wheldon & Wesley, Ltd. 2, 3, and 4, Arthur St., New Oxford St., W. C. 2. Part III.

species the author continues to quote from various writers interesting and characteristic notes on habits and nidification.

Five plates accompany this part. Two in colors are from paintings by Grönvold and represent species of *Geranospizias* and *Melierax*. One color plate illustrates eggs of *Astur* and *Accipiter* and there are two sepia reproductions, one of an original sketch by Wolf of a Goshawk attacking a Capercaillie and one of a photograph of a European Sparrow Hawk's nest.—W. S.

Delacour and Jabouille on the Birds of Central Annam.—This important paper[1] describes a collection made mainly in the province of Quangtri, central Annam, by M. Delacour, the well known French ornithologist, and M. Jabouille, the French Resident of the district. The region is particularly interesting as it is here that the Chinese and Malayan faunas meet. Altogether 311 species were obtained of which several have been described as new in the 'Bulletin of British Ornithologists' Club.'

We have subsequently received a much more elaborate account[2] of this expedition published as No. 1, of the 'Archives of Natural History' by the Societe Nationale d'Acclimatation de France. This is in French and is entirely rewritten with much more elaborate annotations and numerous illustrations additional to the two color plates appearing in the 'Ibis' article. Some of these are plates of birds in color and others in line drawings while there are many half-tone illustrations from photographs of scenery and other views in Annam, the whole forming an extremely attractive volume.—W. S.

Chapman on New South American Birds.—This paper[3] is to use the author's words "a by-product" of the study of the collections received by the American Museum from Ecuador and related countries and is the eleventh of the series.

Fourteen new forms are described while the races of *Compsocoma somptuosa* are considered at some length and their distribution worked out. The descriptions are accompanied by lists of specimens examined and full discussions of relationship such as usually characterize Dr. Chapman's papers. The author calls for any criticism or comment that this paper may inspire in order that they may be considered in connection with his proposed memoir on Ecuadorean birds.—W. S.

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[1] On the Birds of Quangtri, Central Annam; with Notes on others from other parts of French Indo-China. By Jean Delacour and Pierre Jabouille. Ibis. January, 1925, pp. 209–260.

[2] Recherches Ornithologiques dans la Province de Quangtri (Centre Annam) et quelques autres Regions de l'Indochine Francaise. Par J. Delacour et Pierre Jabouille. Paris, 1925, pp. i-xii. pp. 1–197.

[3] Descriptions of New Birds from Colombia, Ecuador, Peru, and Argentina By Frank M. Chapman, American Museum Novitates, No. 160, February 26 1925, pp. 1–14.

Miller on Ptilosis.—In a recent paper[1] Mr. Miller presents numerous observations on ptilosis as a supplement to a former paper on the same subject. He discusses first eutaxy and diastataxy showing that many orders are universally diastataxic, including most of the "water birds," Sand Grouse, Parrots, Owls, Goatsuckers and Rollers; while others, including the Struthious and Gallinaceous birds, Cuckoos, etc., Picariae and Passeres are universally Eutaxic. Then there are other groups which contain representatives of both types of feathering, viz: Megapodes, Pigeons, Rails, Limicolae, aberrant Grues, Steganopodes, Kingfishers, Swifts and Hummingbirds.

The presence of the first primary covert and of the remical, or vestigial eleventh primary, are also considered as well as the number of primaries in the various orders, the variation in the alula, outermost primary covert and the number of rectrices.

The oil gland has been carefully studied and several of Gadow's statements as to its presence or absence in various groups are corrected and similar emendations and corrections of statements regarding the presence or absence of the aftershaft are made.

Finally the presence and character of powderdowns is considered and also the presence and character of the natal down, corrections being made to the statements of various authors.

It would seem that entirely too hasty generalizations have been made by previous writers regarding the characters that Mr. Miller has been investigating and his careful and detailed studies have materially altered our supposed knowledge of prevailing conditions in various families and orders. Taxonomists will therefore find it to their advantage to carefully read this important paper before they take for granted the statements of supposedly reliable writers.

Mr. Miller points out some unwarranted generic separations based on supposed differences in ptilosis and there are doubtless others. He considers *Leptolophus* a typical Cockatoo and not the representative of a distinct family, as Mathews and Iredale have regarded it; while the Tiger Herons he thinks should better be left in one genus. On the other hand he finds that *Leucolepis thoracicus* has twelve rectrices as against ten for the other species of the genus and considers that it should stand as a distinct genus for which he proposes the name *Rhinorchilus* (p. 321), while he would divide the genus *Campothera* on the basis of the presence or absence of an oil gland, those species without the gland comprising the genus *Chrysopicos*.

We have only space to mention a few of Mr. Miller's points but his paper is so full of meat that it will have to be read through by those working on similar lines or engaged in classification of the major bird groups.

Another recent paper[2] deals further with the structure of the aftershaft and its value in taxonomy.—W. S.

[1] Further Notes on Ptilosis. By W. DeW. Miller. Bull. American Museum Nat. Hist. Vol. L, Art. V., pp. 305–331, October 31, 1924.

[2] Variations in the Structure of the Aftershaft and their Taxonomic Value. By W. DeW. Miller. American Museum Novitates. No. 140, October 30, 1924, pp. 1–7.

Van Tyne on the Birds of Charlevoix Co., Mich.—This is an annotated list[1] of about 120 species observed on an expedition supported by the Michigan Department of Conservation in the summer of 1923. Following the method of the plant ecologist the writer lists some twenty-three "habitats" but fortunately he does not use these regularly throughout the list in describing distribution and if for such terms as "edificarian" and "ruderal" simple English had been used, more persons would understand what he was talking about. The county under consideration has apparently not been previously investigated by the ornithologist and the paper therefore is a welcome addition to our knowledge of the distribution of Michigan birds.—W. S.

Tugarinow and Buturlin on the Ornithology of the Yenisee Government.—This paper[2] is a translation into German of the original published in Russian in 1911 and constitutes the fifth number of the 'Ornithological Literature of Russia,' edited and translated by Hermann Grote, which has been appearing recently. It consists of an annotated list of 285 species and forms a valuable contribution to Siberian ornithology.

Prof. Grote is to be congratulated upon making these publications in the Russian language available to ornithologists.—W. S.

Miss Sherman on the House Wren Problem.—Miss Althea R. Sherman has recently published several papers[3] dealing with the iniquities of the House Wren in destroying the nests and eggs of other birds and seems bent on a campaign of extermination against the unfortunate Wren. She terms him a "felon" who "should be sentenced and the sentence executed without dangerous delay."

These articles have inspired others, some of which applaud Miss Sherman's attitude while some, written, we presume, by the class which she refers to as "ignorant and narrow-minded," indignantly refute her charges and give testimony that House Wrens in their vicinity do no appreciable harm to other species.

There is no denying Miss Sherman's statements as to these activities of the House Wren which have been known for many years, indeed the bird's success in driving all other species from his domain was fully described

[1] Notes on the Birds of Charlevoix County and Vicinity. By Josselyn Van Tyne. Printed from papers of the Michigan Academy of Science, Arts and Letters, Vol. I, IV, 1924, pp. 611–627.

[2] A. Tugarinow und S. Buturlin: Materialien über die Vogel des Jenisseischen Gouvernements. Russisch in; Mitt. (Sapiski) der Krassnoja rsker Abt. der Russ. Geogr. Gesellschaft, Sekt. Phys. Geogr., Bd. I, Lfg. 2–4, Krassnojarsk 1911. Aus der ornithologischen Literatur Russlands. Berichte und Übersetzungen von Hermann Grote. V. Ausgegeben als Sonderheft zu "Falco" im Februar, 1925, pp. 1–252.

[3] Down with the House Wren Boxes. By Althea R. Sherman. Wilson Bulletin, March, 1925.

The Problem of the House Wren. By Althea R. Sherman. Bird-Lore. March-April, 1925.

by Alexander Wilson more than a century ago. But the Wren's methods are no worse than the parasitic habits of the Cowbird, the predacious habits of certain Hawks and Owls or the egg destroying propensities of the Blue Jay, and why have not these birds a perfect right to practice their living in the way that nature has ordained that they should? The Wren is no more of a "felon" for destroying the nest of a Bluebird than is a Flicker for destroying a nest of ants.

In nature's scheme all these things were adjusted and everything went well, and it is extremely likely that the very actions above referred to served as a check on overcrowding to the benefit of all concerned.

It is when man comes into the game that the trouble develops and so it has always been! Man is the "felon" not the Wren. In this instance he instituted a tremendous campaign for bird box erection without a thought as to what it would lead to and without providing for any sort of a check, and, just as Miss Sherman has said, most of the boxes are suited for the Wren alone and protect him from the attacks of all other species, with the result that Wrens in certain districts have increased abnormally and by the overcrowding of bird life due to the abundance of boxes, the bad habits of the little bird have been accentuated in his efforts to reduce things to their normal level. In exactly the same way thoughtless and unrestrained charity increases the bad habits of beggars and prevents them from reforming. Is it not possible also, that the promiscuous erection of feeding shelves, so that we may see the birds eat and perhaps photograph them in the act, may render those birds less able to secure food for themselves? If food and nesting boxes were provided when needed and not so lavishly forced upon the bird world we should have no further trouble in this line.

Now the answer to the House Wren problem is to reduce the number of boxes where the bird has become overabundant, just as Miss Sherman has said. But we must also accept the evidence of others that there are places where the Wren has not appreciably affected the presence or abundance of other species, and we must admit that people have a right to prefer the Wren to the other species which he persecutes. On purely economic grounds the Wren is just as valuable a bird as any of the others which he drives away so that it comes down, to some extent, to a matter of sentiment and personal preference.

At the same time there is no doubt that man has thoughtlessly increased the numbers of Wrens at the expense of other species which is an undesirable upset of the balance, and it is incumbent upon him to take steps to remedy the matter. We therefore would strongly advocate a check upon the promiscuous erection of Wren boxes and the reduction in their number where the birds have been demonstrated to be too abundant. This advice is based on practical reasons not sentimental or economic and it should be remembered that it is just as sentimental to protect the Bluebird from the "atrocities" of the House Wren as it is to hold on to our preference for House Wrens in spite of their habits of destroying nests and eggs.

In this connection too we cannot refrain from mentioning the allusions to the nefarious habits of the Cowbird which one sees in the "oölogical" magazines and the satisfaction that the oölogist feels in always removing the Cowbird's egg from the nest of its victim!—W. S.

Clark on Animal Coloration and Flight.—These two papers[1] are full of suggestion for those interested in speculating upon these fascinating subjects. To quote from the former the author says: "It has never seemed quite plausible to me that sexual selection could have a bearing on the coloration of the birds and butterflies. My belief has always been that the differences existing, which are sometimes very great, would eventually be interpreted in terms of differences in the environment of the sexes."

He suggests that in nature the most brilliant living things are the butterflies and the birds of the tree tops. These he contends are protectively colored against bird enemies, since the short focus of the bird's eye renders all images in one plane or nearly so, and the landscape or background appears as a patchwork of various spots of color against which a gaudy butterfly is very hard to see and birds are the only enemies that these free flying or tree top creatures have to contend with. To the eye of the mammal or lizard, sharp vision is only possible in one single plane at a time and a brilliantly colored object would be conspicuous when in focus, hence, he argues, birds of the ground or the underbrush or the back of a female bird sitting on a nest, all of which come within the range of mammal enemies, are dull colored.

The paper considers many other sides of the problem and is well worth a careful study.

The consideration of flight is a full and detailed resumé of this method of progression throughout the animal kingdom. The problem of soaring is explained on the presence of upward currents of air.—W. S.

Recent Papers by Stresemann.—Several important reviews of genera have been published lately by Dr. Sresemann, one treats of the genus *Pitohui*[2] of which fifteen species or subspecies are recognized, from New Guinea and adjacent islands. The species of *Cyornis*[3] are considered in another paper and the forms of *Attila spadicea*[4] in a third, while an extended article[5] deals with various birds of prey. These latter have been mentioned in the notice of the journals in which they appear.—W. S.

[1] Observations on Animal Coloration. By Austin H. Clark. The Scientific Monthly, April 1925, pp. 341–344.

Animal Flight. By Austin H. Clark. The Scientific Monthly, January 1925, pp. 5–26.

[2] Die Gattung Pithui von Erwin Stresemann January 1925, pp. 413–416, no name of journal appears on the separate.

[3] Ueber einige *Cyornis*—Arten. von Erwin Stresemann. Ornith. Monatsberichte, March, 1925.

[4] Mutations studien *Attila spadicea* Gmelin. Jour. f. Ornith., 1925, Heft. 2.

[5] Raubvogelstudien. von E. Stresemann. Jour. f. Ornith., 1925, Heft 2.

Papers on Neotropical Birds by Zimmer.—In a recent paper Mr. John T. Zimmer describes as new two birds[1] obtained on the Peruvian Expedition of the Field Museum of 1922. One of these is *Synallaxis azarae infumata* (p. 103), from the province of Huanuco, and the other *Cyclarhis gujanensis saturatus* (p. 107), from the Maranon River. Lists of all material examined are appended and the descriptions and discussion are full and satisfactory. In another paper he shows that the name *Pipra opalizans* Pelzeln[2] must give way to *P. iris* Schinz, which has three years priority and suggests that both names were based on the same specimen.—W. S.

Papers on Bird Protection.—Mr. George Miksch Sutton, now ornithologist and chief of the educational service to the Pennsylvania Board of Game Commissioners, has issued an attractive 'Year's Program[3] for Bird Protection,' illustrated by numerous pictures of common birds from photographs and from the author's attractive drawings. The text contains all that the reader will want to know about the value of birds and methods of attracting and protecting them and the author makes a very happy plea, in these days of warring about which birds ought to be destroyed and which preserved, when he says: "Are we never to realize and admit that our most sincere reason for protecting birds is simply that we want them as they are about us, whether they are each saving our State so many cents apiece annually or not? "

The New Jersey Audubon Society,[4] is deservedly jubilant at the final success for its efforts to place the Bobolink on the list of protected birds, the last Legislature having passed the bill protecting this species. The "Reedbird" shooters will however probably not allow the matter to rest and the Society will have to be on guard against probable efforts to undo the good work. The Pennsylvania Egret law came perilously near being emasculated in an apparently harmless codification of the game laws when everyone supposed that the milliners had given up the fight for good. Bird legislation requires eternal vigilance.

Miss May T. Cooke in a Department Circular[5] prepared under the direction of the U. S. Biological Survey brings up to date our knowledge of the distribution of the Starling. It has now reached Ohio and North Carolina with stragglers pushing still farther. The suggestion that the immense flocks which eat up everything in sight will prove a "potentiality

[1] Two New Birds from Peru. By John T. Zimmer. Field Museum Natural History, Publication 228. Zool. Series, XII, No. 8, May 20, 1925.

[2] An earlier name for *Pipra opalizans* Pelzeln. Proc. Biol. Soc., Washington, p. 87, May 2–26, 1925.

[3] A Year's Program for Bird Protection. By George Miksch Sutton. Bull. 7, Board of Game Commissioners, Commonwealth of Pennsylvania, pp. 1–47, no date.

[4] New Jersey Audubon Bulletin No. 33, April 1, 1925.

[5] Spread of the European Starling in North America. By May Thatcher Cooke. U. S. Dept. Agriculture, Dept. Circular 336, March, 1925, pp. 1–7.

for harm" is well founded and it would seem the part of wisdom to take measures at once to reduce the hordes of this introduction from the Old World before it is too late.—W. S.

Economic Ornithology. A Good Word for the Starling.—In New Zealand where introduced birds have not made themselves entirely welcome, good work by any of them is worthy of comment. In an exhaustive article[1] on the cattle-tick (*Haemaphysalis bispinosa*), a serious pest in that country, Mr. J. G. Myers names four species of wild and two of domesticated birds among the natural enemies, and says: "The chief natural enemies are birds, and of these the most important is the English Starling." On one farm with good nesting facilities for Starlings the infestation by cattle-ticks was practically negligible. Proposals for introducing to New Zealand other birds that might feed on the cattle-ticks are deprecated.

Birds Destroying Corn-borers in Winter.—The European corn-borer is a very serious pest that has recently been extending its range in this country. Its larvae hibernate within the stalks of corn and various other plants, where they are attacked by various birds. Of these the Downy Woodpecker seems most important but Chickadees, Grackles, and Starlings join in the work. In recent experimental studies it was found[2] that birds destroyed from 12 to 88 per cent of the larvae in various lots of infested cornstalks exposed to them. The investigator refers to birds as "becoming a really important factor in the reduction of the numbers of the corn-borer," and says, "there is ample evidence to indicate that their industry may help to hold the insect partially in check, or even so to reduce its numbers in some localities during the winter and spring that damage by the species may not be extensive enough to cause heavy loss to crops in such localities the following summer."

Birds as Enemies of Rice.—In a very comprehensive book on rice[3] Professor E. B. Copeland makes the statement that "Birds are everywhere pests of rice, and are its most destructive foes in many places." Not many details are given but *Munia* in the Orient, *Dolichonyx* in the United States and English Sparrows are mentioned. Interesting descriptions are given of frightening devices used by the Igorotes who, the writer says, "have become specialists in the use of scarecrows."

Bird Introduction in Hawaii.—Notice has recently been published[4] of the continued introduction and observed nesting in Hawaii of the Australian Magpie Lark (*Grallina picata*). Other birds being considered

[1] Bul. 116, New Zealand Dept. Agr., 105 pp., 17 figs., Dec. 1924.

[2] Barber, Geo. W., The efficiency of birds in destroying over-wintering larvae of the European corn-borer in New England, Psyche, Vol. 32, No. 1, Feb. 1925, pp. 30–46, Figs. 1–2, Pl. 1.

[3] Macmillan and Co. Ltd., London, 1924, pp. 352.

[4] Rept. Board Commrs. Agr. Forestry Hawaii, (Bienn. 1923–1924) 1925, pp. 42–43.

for introduction are our Western Meadowlark (*Sturnella neglecta*), and the Australian Willie Wagtail (*Rhipidura tricolor*), and Jacky Winter (*Microeca fascinans*). All of these projects have in view the better control of insect pests.—W. L. M.

The Ornithological Journals.

Bird-Lore. XXVII, No. 2. March–April, 1925.

Elliot Coues to John Burroughs on "Wake Robin."—A most interesting letter witten in February 1874 when Coues was in his thirty-third year.

Two Days with the American Avocet. By W. W. Bennett.—At Devil's lake, N. D., illustrated by excellent photographs.

The Food of the Western Horned Owl. By H. H. Pittman.—Mainly rabbits and smaller rodents. Makes the sensible suggestion that these birds be killed only when located near poultry yards and actually doing harm.

The Problem of the House Wren. By Althea R. Sherman. (See p. 460)

A Day with a Wren Family. By Mable Densmore.

The Migration of North American Birds. Costa's, Anna's, Rieffer's and Buff-bellied Hummingbirds. By H. C. Oberholser with plumage notes by F. M. Chapman and a colored plate by L. A. Fuertes.

Bird-Lore. XXVII, No. 3. May–June, 1925.

Bird Study Near Home. By Maunsell S. Crosby.—With several excellent photographs of nesting birds.

A Record-breaking Mourning Dove. By Mary H. Beam.—Occupied an unused Martin box in which a hole had been broken and later a shelf box on a near-by porch, in which during 1924 no less than five breeds were raised, the first leaving the nest May 10 and the last September 26.

The Problem of the House Wren.—Two writers admit the egg-destroying propensities of the bird but do not apparently believe in destroying the species, another is bitter in denouncing it and a fourth is entirely in favor of it, finding that in his vicinity it does not perpetrate the crimes of which it is accused. (See p. 460.)

Bird Study on a Mediterranean Cruise. By W. A. Squires.

Bittern Study. Part II. By Agnes M. Learned.

The Condor. XXVII, No. 2. March–April, 1925.

Discovery of a Nest and Eggs of the Blue-throated Hummingbird. By Rose Carolin Ray.—On a pendent wire in a deserted cabin in the Huachuca Mts., Arizona.

Notes on Sea-birds Observed between England and New Zealand via Panama. By J. G. Myers and R. A. Falla.

Aquatic Visitors to Lake Meritt, Oakland, California. By A. S. Kibbe.—Shows the fluctuation in the number of the various species coming to

the lake, the most abundant of which are the Coot, Pintail, Canvas-back, Baldpate, Ruddy Duck, Scaup and Shoveller. At the height of the season, in December and January, no less than 5000 wild fowl have been counted on the Lake.

The Relative Value of Bird Measurements. By W. H. Bergtold.—A mathematical study of departures from the average in the four usual measurements used in ornithology seems to show that the wing measurement is the most reliable possessing 68 points of accuracy, while the tarsus has 20 points, the tail 7 and the bill 5.

A Report on the Birds of Northwestern Alaska and Regions Adjacent to Bering Strait. Part II. By Alfred M. Bailey. [Part III in May-June issue.]

The Timberline Sparrow. A New Species from Northwestern Canada. By Harry S. Swarth and Allan Brooks.—*Spizella taverneri* (p. 67).

The Condor. XXVII, No. 3. May–June, 1925.

Observations on the Xantus Hummingbird. By Chester C. Lamb.

Courtship of the Brandt Cormorant. By Charles W. Townsend.

Some More Notes on Saskatchewan Birds. By H. H. Mitchell.—At Last Mountain and Rocky Lakes.

Photographing the Rufous-crowned Sparrow. By Roger Simpson.

Nesting of the Allen Hummingbird in Golden Gate Park. By H. C. Bryant.

Additional Information Concerning the Birds of Yosemite Valley. By Charles W. Michael.

The Wilson Bulletin. XXXVII, No. 1. March, 1925.

Down with the House Wren Boxes. By Althea R. Sherman. (See antea p. 460.)

Owl Notes from Ohio. By Chas. R. Wallace.—Long-eared and Great Horned Owls.

Bird Banding at the Iowa Lakeside Laboratory during the Summers of 1923 and 1924. By Dayton Stoner.

The Birds of Sioux Falls, South Dakota, and Vicinity. By Adrian Larson.

There is an account with group photograph of the annual meeting of the Wilson Club at Nashville, Tenn. and an editorial appreciation of Prof. Lynds Jones who retires as editor after a service of thirty-six years.

The Oölogist. XLII, Nos. 2, 3, 4 and 5. February to May, 1925.

Numerous short papers on the nesting of various species, the most important contribution being A. D. Henderson's paper 'With the Early Breeders' at Belvidere, Alberta.

We learn in the April issue that Maryland is still paying large bounties for Hawks and has not profited by the experience of Pennsylvania and other states in this matter, and also find further evidence of the extermination of the Burrowing Owl through the activities of gopher poisoners.

The Ibis. (12th Series) I, No. 2. April, 1925.

A Further Contribution to the Ornithology of Palestine, Transjordania and Petra. By Col. R. Meinertzhagen.

The Distribution of the Phalaropes. By Col. R. Meinertzhagen.—A very valuable compilation including data from specimens in three American Museums. It is to be regretted that the material in the collections at Washington, Cambridge and Philadelphia was not also included as we are sure the data would have been cheerfully furnished.

On the Birds of North and Central Dafur, with Notes on the West Central Kordofan and North Nuba Provinces of British Sudan. By Hubert Lynes.

Flight Feathers as Age Indicators in Dengragapus. By A. J. van Rossem.—An important study of the sequence of plumage in this genus with the suggestion that it follows in some respects the first fall sequence of *Lagopus*.

A Contribution to the Ornithology of Macedonia and the North Aegean Area. Observations made during a Commission in H. M. S. 'M. 28,' January, 1917, to February, 1918. By James M. Harrison.

A Contribution to the Ornithology of Navarre, Northern Spain. By Claud B. Ticehurst and Hugh Whistler.

Some Points in Labelling Specimens. By Claud B. Ticehurst.—Suggests notes on presence and location of moult, age as shown by skull structure, and condition of reproductive organs. Helpful cuts showing the progress of ossification of the skull and the appearance of the ovaries in birds of different ages are given.

Notes on Nests and Eggs of some British Guiana Birds. By Charles G. Young

Some Notes on the Genus Polyplectron. By Percy R. Lowe.—*P. bicalcaratum* Linn. proves to be the proper name for the species of Burma and Siam formerly known as *P. chinquis* and the former *bicalcaratum* becomes *malaccensis* Scopoli. The race from Bengal, western Assam, etc. which seems separable is named *P. b. bakeri* (p. 477) and the name *P. b. bailyi* (p. 482) is proposed for a bird bred in captivity from parents whose original habitat is unknown but which are thought to be identical with birds obtained by William Beebe from Bangkok. A list of nine forms of the genus is given.

The Dates of Publication of the Plates of the Birds in Gray and Hardwicke's 'Illustrations of Indian Zoology' with a short account of General Hardwicke. By N. B. Kinnear.

Bulletin of the Northeastern Bird Banding Association. I, No. 2. April, 1925.

A Cowbird's Maternal Instinct. By Laurence B. Fletcher.—A female Cowbird seen to feed a young bird in a trap in which both had been caught, which gives some support to the claims, several times made, that the female

Cowbird did not lose all interest in its young and still possessed some of the maternal instincts.

Dr. J. B. May records the occurrence of the same Purple Finches at several stations not far from one another. Under "Juvenile" birds is an appeal for greater accuracy in identifying the age and plumage of trapped birds. We should also suggest more accuracy both among bird banders and others in the use of the word "juvenile," the *juvenal* plumage as explained by Dr. Dwight is one thing, while the first winter, post-juvenal, or bird of the year (in its strict interpretation) is another. "Juvenile" may apply to either and is hence a very loose term.

Bulletin of the British Ornithologists' Club. CCXCII. December 29, 1925.

W. L. Sclater shows that *Oreomyias-riisi-Cyornis magnirostris* and also reviews the genus *Pedilorhynchus* describing as new *P. comitatus aximensis* (p. 45) from Gold Coast. Dr. Hartert describes *Rhyticeros plicatus mendanae* (p. 46) from the Solomon Islands. There was a discussion on the possibility of hybrid origin of *Pseudotadorna cristata* Kuroda.

Bulletin of the British Ornithologists' Club. CCXCIII. January 31, 1925.

W. L. Sclater presents a full review of the genus *Batis*. E. Stuart Baker describes three new Oriental Ploceidae.

Bulletin of the British Ornithologists' Club. CCXCIV. February 27, 1925.

H. Kirke Swann has an extended discussion on the races of the Golden Eagle, recognizing eight races, the North American bird being regarded as distinct under the name *canadensis*.

Five new birds from Tonkin are described by N. B. Kinnear and five from central Africa. By H. F. Stoneham.

Bulletin of the British Ornithologists' Club. CCXCV. March 31, 1925.

H. Kirke Swann discussed the races of *Gypaetus barbatus* of which he recognizes five.

E. C. Stuart Baker describes *Erythrura prasina coelica* (p. 84) from Borneo and *Uroloncha rufiventris* (p. 84) for *U. pectoralis*, preoccupied.

Gregory M. Mathews proposes two new subspecies and four new genera of Australian birds and C. B. Ticehurst, *Pyrrhulauda grisea siccata* (p. 87).

Bulletin of the British Ornithologists' Club. CCXCVI. April 25, 1925.

Lord Rothschild proposes *Muscicapa collini* (p. 90) for *M. blythi* and Dr. Hartert, proposed *Oriolus chinensis macassariensis* (p. 90) both being preoccupied.

C. B. Ticehurst presents data to establish the distinctness of the Iceland Red-wing, *Turdus coburni* Sharpe, and discusses the races of *Panurus biarmicus*.

E. C. Stuart Baker describes *Procarduelis nipalensis intensicolor* (p. 92) and *Passer montanus tibetanus* (p. 92).

G. M. Mathews proposes seventeen new genera among which are generic names for *Mohoa braccatus* and *Acrulocercus bishopi*, two Hawaiian birds.

British Birds. XVIII, No. 9. February 2, 1925.

Notes on the Nesting of the Short-eared Owl in Yorkshire. By Rev. E. A Armstrong and G. W. Phillips.—Interesting to compare with Mr. Urner's observations in 'The Auk.'

Notes on Some Birds of North Pembrokeshire, 1894–1914. By T. Ground

Some Notes Taken at the Eyrie of a Golden Eagle. By Seton and Audrey Gordon.—With some excellent photographs taken from a nearby ledge.

British Birds. XVIII, No. 10. March, 1925.

A Study of the Robin by means of Marked Birds. By J P. Burkitt.—A continuation of a previous study. Several interesting generalizations are made among which may be mentioned the retention of his territory by the male throughout the year and the wandering of the female after the moult. The young seem to wander without regard to territory and it is the author's belief that only about one to a pair survive.

The Smallest Book on Ornithology. By H. S. Gladstone.—An account of forty-eight species with plates, by Alfred Mills, London, 1810. Proves to be the original of a French translation mentioned in Newton's Dictionary of Birds. This volume cut down in binding measures 2.25 by 2 ins. and the French edition 2.6 by 2.15 ins.

The "British Birds" Marking Scheme, Progress for 1924. By H. F. Witherby —A list of the birds banded and some interesting returns.

British Birds. XVIII, No. 11. April, 1925.

Field Notes from Glamorganshire (II). By G. C. S. Ingram and H. M. Salmon.

Good photographs of Bewick's Swans and Black-necked Grebe.

Ornithological Notes from Norfolk for 1924. By B B. Riviere.

Effect of a Hot Sun on Young Birds. By A. H. Willford.

On the Effect of Extreme Cold on Birds. By Wm. Rowan.—Juncos kept in an open cage survived 52° below zero Fahr. without any inconvenience as did wild Chickadees. The author considers that in the case of small birds found dead the cause is lack of food due to the source being covered by snow and not to the cold.

British Birds. XVIII, No. 12. May, 1925.

Effect of Weather on the Song Impulse. By C. E. Alford.—Force and direction of wind and state of the atmosphere have more effect on song than temperature.

Courting Display of the Red-breasted Merganser on Salt Water. By H. R. Colman and Henry Boase.

Avicultural Magazine. (4th series) III, No. 1. January, 1925.

Articles on the Bulbuls, Cuckoo Shrikes and Flycatchers. By J. Delacour.

Nesting of the Cinereous Tinamou (*Crypturus cinereus*). By W. Shore Baily.—Several sets of eggs laid in his large open summer aviary and young raised, the male doing the incubating.

Avicultural Magazine. (4th series) III, No. 2. February, 1925.

Articles on the Wagtails and Pipits and the American Warblers. By J. Delacour.—Our reliance upon these articles is somewhat shaken when we read the descriptions of our familiar American Warblers and learn that the Black-throated Green has an "olive maroon crown and that the top of the head in the Ovenbird is "bright red"! etc.

Some Notes on a Rare Ring-necked Parrakeet. By Allen Silver.—*Palaeornis salvadori.*

Bird Life near Buenos Aires. By B. E. Potter.

Avicultural Magazine. (4th series) III, No. 3. March, 1925.

Articles on Warblers, Creeper, Nuthatches, Wrens, etc. by M. Legendre and J. Delacour.

Scenes in the Lives of Two Eagles. By F. D. Welch.—*Haliaeetus leucoryphus.*

Avicultural Magazine. (4th series) III, No. 4. April, 1925.

Timeliidae. By J. Delacour.

Some Notes on a Yellow-backed Lory (*Lorius flavopalliatus*). By Miss D. G. Crosse.—With a colored plate.

The Oölogists' Record. V, No. 1. March, 1925.

Oölogical Records from Nyasaland. By A. H. Paget Wilkes.

On Bird Life in Entre Rios (Argentine Republic). By C. H. Smyth.

The Emu. XXIV, Part 3. January, 1925.

The Fairy Warbler: A Rediscovery. By A. H. Chisholm.—*Gerygone flavida.*, long confused with allied species.

The greater part of the number is taken up with the account of the annual meeting of the R. A. O. U. held at Rockhampton, Queensland, and the excursion to Yeppoon and camp-out at Byfield. The proceedings are

given in great detail and a large variety of subjects considered. The address of the president on 'Naming Australian Birds' is an able historical review of the nomenclature question as it affects the birds of Australia. Incidentally he calls attention to the fact that the name *Gallinago* for the Snipe which has been included in the 'Official List' compiled by the International Commission has been superceded in several recent lists by *Capella* apparently showing that the authority of the Commission so far as this 'list' is concerned amounts to nothing.

There are many photographic illustrations of the meeting and of nests seen on the camp-out.

The South Australian Ornithologist. VIII, Part 1. January, 1925.

Numerous local notes and a paper by A. J. Campbell on 'The Abuse of Nomenclature' in which he criticises Mathews' recent paper and claims that the International Code is not retroactive and that homonyms are not homonyms unless they refer to the same bird. He should realize that homonyms concern names not birds.

The South Australian Ornithologist. VIII, Part 2. March, 1925.

The Pectinate Middle Claw in Australian Birds. By A. M. Morgan.

Notes on the Birds of the Port Lincoln District. By J. B. Cleland.

Birds Seen Between Beltana, Farina and Cordillo Downs Station. By J. B. Cleland.

Revue Francaise d'Ornithologie. No. 190. February, 1925. [In French.]

The Alpine Titmouse. By H. Jouard.—A consideration of the geographic races, all of which are considered as subspecies of *P. atricapillus*. [Continued in March.]

The Moults and Habits of the Buzzards. By MM. Chiquet.

Revue Francaise d'Ornithologie. No. 191. March, 1925. [In French.]

A French Species new to North Africa. *Lusciniola m. melanopogon*. By A. Blanchet.

On the Nesting of the Flamingos in the Camargue. By A. Gibert and A. Menegaux.

Revue Francaise d'Ornithologie. No. 192. April, 1925. [In French.]

On an Eagle in the Hamonville Collection and the Question of the Small Eagles. By L. Lavauden and H. Heim de Balsac.—*Aquila clanga* and *A. pomarina*.

Ardea. XIV, Afl. 1–2. March, 1925. [In Dutch.]

On the Ethology and Psychology of *Rhea americana*. By A. F. J. Portielje.

On the nesting of the Bittern (Botaurus stellaris), by C. G. B. ten Kate.

Ornithological Notes from Egypt. By A. Burdet.

Lois Agassiz Fuertes. By D. Shoute.—A biographical sketch with reproduction of one of his drawings.

Rook Colonies in Holland. By G. Walda.

Also numerous local notes.

Journal für Ornithologie. LXXIII, Heft. 2. April, 1925. [In German.]

On the Floral-Faunistic Associations of South China. By R. Mell.—Treats of the mountain rain forest.

The Results of my Second Expedition to Mallorca. By A. V. Jordans.

The Bird in the Medicine of the Ancients. By W. Arndt.

Ornis Saxonica. A Contribution to the Bibliography of the Country. By R. Schegel.

Meliphaga analoga and its Close Relatives. By E. Stresemann.

New Bird Species from North Brazil. By E. Snethlage. Eleven species and subspecies.

Mutation—Studies. By E. Stresemann.—XXII, *Atilla spadicea.*

Some Remarks on Koenig's 'Songbirds of Egypt.' By E. Hartert.

Studies of the Birds of Prey. By E. Stresemann.—IX, *Buteo intermedius* and *B. buteo.* X. The White-tailed Buzzards of South America. XI. On the Indo-Australian Accipiter species.

Ornithologische Monatsberichte. XXXIII, No. 2. March, 1925. [In German.]

Proparus striaticollis and *P. vinipectus bieti.* Two Characteristic Birds of Southeast Tibet. By H. Weigold.

On Two Very Rare New Guinea Birds. By E. Hartert.—*Circus approximans gouldi* and *Excalfactoria lepida.*

On the *Cyornis* species. By E. Stresemann.—*C. rufigastra rhizophorae* (p. 50), north coast of West Java; *C. r. litoralis* (p. 50), Palawan; *C. superba* (p. 52), Borneo.

Contributions to the Breeding Habits of Birds with Consideration of Oölogy. I, No. 4. March, 1925. [In German.]

Egg-Measurements, Shell, Egg and Set Weights of Some East African Birds. By L. Schuster.

On Large Sets in Water Birds. By A. Koenig.

On the Breeding Habits of Some Wheateaters. By M. Harms.

Tori. IV, No. 19. April, 1925. [In Japanese.]

At the Breeding Season of the Black-tailed Gull. Plate I. Photo by K. Tago.

On the Distribution of *Phasianus c. karpowi* and *pallasi.* By T. Mori.

A Collection of Petrels from the Sagami Bay. By Y. Matsudaira.

On the Breeding of *Apus melba melba* in Switzerland. By M. Hachisuka.

Birds as Natural Monuments in Japan. By N. Kuroda.

On a Small Collection of Birds from British North Borneo. By N. Kuroda. [In English.] *Oriolus xanthornus tanakae* (p. 3).

Ornithologische Monatsberichte. XXXIII, No. 3. May, 1925. [In German.]

The Loss of Color in Turacin. By I. Krumbiegel.

On the Breeding of Emus. By K. Max Schneider.

Numerous local papers and short notes. R. Neunsig describes as new *Ploceus galbula arabs* (p. 93) from Aden.

Ornithological Articles in Other Journals.[1]

Simpson, G. B. Oregon Jays. (Canadian Field-Naturalist, February, 1925.)

Calvert, E. W. A Preliminary List of the Birds of the Lindsay District, Ontario. (Canadian Field-Naturalist, March, 1925.) Concluded in April issue.

Blanchet, G. H. An Exploration into the Northern Plains north and east of Great Slave Lake. List of the birds observed. (Canadian Field-Naturalist, March, 1925.)

Williams, M. Y. Notes on the Life along the Yukon-Alaska Boundary. —List of the birds. (Canadian Field-Naturalist, April, 1925.)

P. B. Philipp. Notes on Some Summer Birds of the Magdalen Islands. (Canadian Field-Naturalist, April. 1925.) Accounts of the nesting of the Least Sandpiper, Wilson's Snipe, Rusty Blackbird, Semipalmated Plover, Fox Sparrow and Black-poll Warbler.

Sutton, Geo. Miksch. The Ruffed Grouse Situation in Pennsylvania. (Wild Life Magazine, Greenville, Pa., January–February, 1925.)

Stoddard, Herbert L. Local Bird Notes. Shore-birds on the Wisconsin shore of Lake Michigan with photograph of the nest of a Piping Plover. (Yearbook of the Milwaukee Public Museum, 1923.)

Bean, Robert A. A Black Herring Gull. (Yearbook of the Milwaukee Public Museum, 1923.) Captured at Milwaukee February 10, 1925, and now in the zoological garden there.

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[1] Some of these Journals are received in exchange, others are examined in the library of the Academy of Natural Sciences of Philadelphia. The Editor is under obligations to Mr. J. A. G. Rehn for a list of ornithological articles contained in the accessions to the library from week to week.

Macnamara, Charles. A Bird Trickster Outwitted. (Natural History, January-February, 1925.) Yellow Warbler and the Cowbird with photograph of a two-storied nest.

Bailey, Alfred M. The Snowy Owl in its Northern Home. (Natural History, January-February, 1925.) Admirable photographic illustrations of the tundra, the Owls and their young.

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Evans, William. The Starling (*Sturnus vulgaris*) in the Forth Area. (Scottish Naturalist, Jaunary–February, 1925.)

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Bangs, O. and Pennard, T. E. A New Blue Water-Thrush from China. (Occasional Papers of the Boston Society of Natural History, February 27, 1925.) *Myophonus caerulescens immansuetus* (p. 147) Ichang, Hupeh.

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NOTES AND NEWS.

Eugene Pintard Bicknell, a Fellow and Founder of the American Ornithologists' Union, died at Hewlett, Long Island, N. Y., February 9, 1925. He was born at Riverdale-on-Hudson, September 21, 1859, and at the time of his death was in his 66th year. His interest in ornithology was manifested at an early age. Before he was 19 he had published an important paper on 'The Evidences of the Carolinian Fauna in the Lower Hudson Valley,' before he was 22 he had discovered the Thrush that bears his name, and when he was 24 he became a Founder of the Union, the youngest in the list. His activity in the organization of the Union was shown by his election as temporary secretary of the first meeting, his appointment on the committees on 'Migration of Birds' and on 'The European House Sparrow,' and the adoption of a special resolution of thanks for his services on the Committee on Arrangements. The following year he was appointed a member of the original committee on 'Bird Protection,' and when the committee was reorganized in 1885 he was made its secretary.

Bicknell was a close and careful field observer. His ornithological papers relate mainly to bird song and to the birds of the Catskills, the Lower Hudson River Valley, and Long Island. In his early years he had an unusually keen ear for bird notes, and it was through this circumstance that he was led to the discovery of the Thrush named in his honor, as recorded in his interesting paper 'Sketch of the Home of *Hylocichla aliciae bicknelli.*' His 'Study of the Singing of our Birds,' the first part of which was published in the initial number of 'The Auk' was one of the most extended contributions to the subject that had appeared up to that time, while his 'Review of the Summer Birds of a part of the Catskill Mountains' published in the 'Transactions of the Linnaean Society' in

1882 still remains one of the important papers on the bird life of this region. He was also interested in reptiles and batrachians and was an enthusiastic botanist, but he never lost his interest in the local distribution of birds, as shown by several contributions to recent volumes of 'The Auk' and his last paper on 'The Status of the Black Gyrfalcon as a Long Island Bird,' which appeared a year before his death.

As a botanist, Bicknell was even more energetic and better known than as an ornithologist and a large proportion of his scientific papers, numbering in all about 100, contained the results of his botanical observations. While a close student of several groups, his most important and most extended paper was probably the 'Ferns and Flowering Plants of Nantucket,' contributed to the Bulletin of the Torrey Botanical Club' at intervals between 1908 and 1919. He also contributed to 'Addisonia,' 'Rhodora' and 'Torreya.' In addition to being a Fellow of the American Ornithologists' Union, he was a member of the American Association for the Advancement of Science, the Linnaean Society of New York, the Botanical Society of America, the Torrey Botanical Club, and the Philadelphia Botanical Club. Natural history with him was an avocation and not a vocation, and it is much to his credit that notwithstanding the limitations imposed by the exacting demands of business in the banking house of Munroe and Company for many years, he was able to produce so many scientific papers and technical work of such high quality. Unfortunately, he was known personally to only a few members of the Union, as he was never present at any meetings after the early ones in New York.

In accordance with the custom of recent years, a Memorial of his life and work will be presented at the next annual meeting.—T. S. P.

Tadeusz Chrostowski, a Corresponding Fellow of the American Ornithologists' Union, elected in 1921, died of malarial fever, April 4, 1923, in the wilds of southern Brazil at Pinheirinhos, about 70 kilometers east of the little town of Foz do Iguassu, in the State of Paranà. To Tadeusz Jaczewski, a companion on his last expedition, we are indebted for the following facts regarding Chrostowski's romantic career, which with his portrait have recently been published (Ann. Zool. Mus. Pol. Hist. Nat., Vol. III., pp. 167–172, Dec., 1924).

Born on October 25, 1878, at Kamionka, in the province of Galicia, Austria, now Poland, Chrostowski at an early age displayed an interest in natural science, especially in the habits of birds and mammals, but on account of unfortunate circumstances his studies in these lines were postponed for some years. Shortly after entering the University of Moscow, he took part in some student demonstrations and in consequence was deported for three years to northern Siberia on the lower Obi. Soon after his return, the outbreak of the Russo-Japanese War of 1904 compelled him to take part in the campaign as captain of a company in Manchuria.

After the close of the war he conceived the idea of undertaking a scientific expedition to South America, a plan inspired by the example of his compatriot Jelski, who, under similar circumstances, after the Polish uprising of 1863 had gone to French Guiana and Peru. Being practically without resources, Chrostowski decided to emigrate as a colonist to southern Brazil, in the State of Paranà, where in 1910 he located on the Rio Iguassù in the Colony of Vera Guarany. Then after a year spent in working the land and collecting in the forests, finding that his scientific work was not progressing as he desired, he made a trip of several months along the Rio Ivahy to the mouth of the Rio dos Indios. He then returned to Europe, and at the Branicki Museum in Warsaw devoted his attention to working up his collections, the results of which appeared in his paper published in 1912 in Polish and French, entitled 'Collection ornithologique faite a Paranà en 1910 et 1911.'

Desiring to continue field work he was able through the assistance of Dr. C. E. Hellmayr, then at the Zoological Museum at Munich, to set out once more for Paranà about the end of 1913. This time he explored the eastern part of the State beginning near Curityba, then visiting the colonies of Affonso Penna and Antonio Olyntho, and finally Terra Vermelha at the confluence of the Rio Iguassù and the Rio Negro. Unfortunately the great World War cut short his trip and compelled his return, but being unable to reach Poland he remained in Russia until 1918. At Petrograd during the revolution he was compelled to conceal his identity as a Pole and a former officer, but in spite of cold and hunger he devoted as much time as he could to study in the Zoological Museum. Through the assistance of Bianchi he was able to examine the types of birds in the collections of Kittlitz, Langsdorff and Ménétriés, made in Rio de Janeiro, Minas Geraes and Chile, and in 1921 published the results of his study in a paper entitled 'Sur les types d'oiseaux néotropicaux du Musée Zoologique de l'Academie des Sciences de Pétrograde.'

Finally reaching Poland in 1918, he enlisted as a lieutenant in the Polish Infantry, and at the close of the war in 1920 was made curator of the section of neotropical birds at the Polish Museum of Natural History at Warsaw. Here he was occupied in putting in order the collections of Jelski, Stolzmann, Kalinowski, Siemiradzki, and others, in arranging his notes and in publishing part of the results of his second expedition in a paper on 'Some rare or little known Species of South Brazilian Birds.'

In the meantime, he planned another trip to Brazil and about the end of 1921 set out on his third and last visit to Paranà in charge of the first scientific expedition organized by the Polish Government. He had intended this time to explore the western part of the State. After a difficult journey through the forests of the Rio Ivahy and the upper Paranà, he succumbed to malarial fever, and was buried not far from the mouth of the same Rio Iguassù, on which only a few years before he had located as a colonist. Besides the papers above mentioned which appeared in the

Annals of the Polish Museum, he has published in Polish a number of articles and letters and an account of his first two expeditions, in a volume entitled 'Paranà.'—T. S. P.

EUGÈNE LOUIS SIMON, A Corresponding Fellow of the American Ornithologists' Union since 1923, died at Paris, France, November 17, 1924, after having been in poor health for some time. M. Simon was born in Paris, April 20, 1848, and from his earliest youth applied himself to the study of zoology. At first his activity was exclusively confined to entomology, and he devoted most of his time to the Arachnida (Spiders), of which he became one of the greatest authorities in the world. Rather late in life he turned his attention to ornithological pursuits, specializing in the study of the family of Hummingbirds, of which he formed one of the finest collections in existence. The writer of this notice enjoyed the privilege of being initiated by the deceased naturalist into his favorite ornithological studies. During the many days spent in his beautiful home at 16 Villa Said, a secluded spot in the busy city, not far from the Bois de Boulogne, he had ample opportunity of appreciating his master's profound knowledge of these attractive birds. M. Simon was a very painstaking worker, combining excellent judgment of systematic characters with a thorough knowledge of the pertinent literature. Besides numerous smaller papers published in various periodicals, he issued in 1907, a "Catalogue des espèces actuellement connues de la Famille des Trochilidae," outlining a new classification of the Hummingbirds which was followed in 1921 by his "Histoire naturelle des Trochilidés," a masterpiece of its kind. Being a man of ample means, M. Simon traveled a great deal, visiting the Philippines, Venezuela, Ceylon, South Africa and Egypt, and also took part in several of the Ornithological Congresses. He had a charming personality, possessing the perfect manners of the well-bred Frenchman, and was always ready to give advice and good counsel. He was the recipient of many honors, being a Chevalier of the Legion of Honor, a Corresponding Member of the French Academy of Sciences, an Associate of the Paris Museum, and Honorary President of the Entomological Society of France. His large entomological and ornithological collections, we understand, have been bequeathed to the Muséum d'Histoire Naturelle of Paris.—C. E. HELLMAYR.

NED HOLLISTER, a member of the Union since 1910, died at Washington, D. C., November 3, 1924, at the age of 48. Born in Delavan, Wisconsin, November 26, 1876, the youngest son of Kinner Newcomb and Frances Margaret (Tilden) Hollister, he received his education in the high school of Delavan. Through early association with Ludwig Kumlien, then a professor at Milton College, he became interested in birds at the early age of 12, at 16 he published his first papers on ornithology, and at 18 was elected an Associate of the Union.

In 1901, on his first trip to Washington, D. C., he made the acquaintance of several of the men with whom he was afterwards associated. In the summer of 1902 he joined Vernon Bailey in Texas and thus began a series of half a dozen notable field trips which he made under Government auspices. In the following year he visited Alaska, in 1904 after receiving a permanent appointment with the Biological Survey, he collected in northern Utah, Nevada, Oregon, California, Arizona and southern New Mexico until late in 1905, in 1909 he again worked in California, in 1911 he had charge of a party for the U. S. National Museum in the Canadian Rockies, and in 1912 visited the Altai Mountains, Siberia, and Mongolia, in company with Dr. Theodore Lyman under the auspices of the Smithsonian Institution. In the meantime, in 1910, he had received an appointment as Assistant Curator of Mammals in the National Museum, and finally in 1916 was made Superintendent of the National Zoological Park, a position which he filled with distinction until his death. During the 22 years of his official services his work was occupied mainly with mammals, a full account of which has been given by Dr. W. H. Osgood in the 'Journal of Mammalogy' for February, 1925.

Although a model field collector and park superintendent, Hollister was probably at his best as a museum curator. He found such work thoroughly congenial and improved every opportunity to study the collections under his care. His publications numbered about 150, of which the outstanding ones are his 'East African Mammals' in three parts, and his editorial work on the first five volumes of the 'Journal of Mammalogy.' His chief ornithological contributions were his work on the 'Birds of Wisconsin' in collaboration with Ludwig Kumlien, completed in 1904 after the death of the senior author, his papers and notes in 'The Auk' and his development of the bird collection in the National Zoological Park, including a complete series of North American Ducks and Geese. Besides his membership in the Union he was a Fellow of the American Association for the Advancement of Science, an honorary member of the Sociedad Estudios Biologicos of Mexico, Vice-President of the Baird Ornithological Club, and a member of the Biological Society of Washington (president, 1921), the American Society of Mammalogists, and the Washington Academy of Sciences.

Hollister had a faculty of making friends readily and won for himself a high place in the esteem of his associates. Quiet, modest, a lover of nature, and a keen observer, he combined in a remarkable degree the essentials of a thorough systematic worker in the field or the museum, while his carefulness and accuracy and his familiarity with the literature of his subject added the qualifications necessary for high-grade editoral work. Although after his return from Siberia his health was never robust he succeeded by methodical application in accomplishing some of his best work and completed his 'East African Mammals' shortly before his death. Few men with the interruptions of field work and the distractions of ad-

ministrative duties such as he had have been able to accomplish more or to produce work of higher quality.—T. S. P.

ROBERT OLIVER MORRIS,a Member of the A. O. U., died at his home in Springfield, Mass., April 13, 1925, in his seventy-ninth year. He was a son of George B. and Elizabeth Lathrop Morris, both members of old Springfield families, and was born October 18, 1846 in a house near the home in which he died. He attended the public schools in his native city, later entering Wilbraham Academy and afterwards continuing his studies at home with a private instructor. He took up the study of law in his father's office and was admitted to the bar in 1873. At the fall election of that year he was chosen "clerk of courts" to succeed his father who had died, and was continued in that office until his death, a period of service longer than any other similar living officer in the commonwealth. He was the candidate, at every election, of both the Republican and Democratic parties.

Mr. Morris was universally beloved and always interested in the betterment of Springfield. He was vice-president of the City Library Association, and chairman of the board of sinking fund commissioners. He had been a park commissioner and at one time was president of the Springfield Five Cents Savings Bank.

A lover of the great outdoors, interested in hunting and fishing, Mr. Morris early became a student of ornithology. He was the foremost local authority on birds and contributed valuable notes, from his vicinity, to 'The Auk,' for many years. His letters about birds to 'The (Springfield) Republican' will long be remembered. In 1891, in collaboration with Wm. W. Colburn, he published Birds of the Connecticut Valley in Massachusetts. In 1901 his "Birds of Springfield and Vicinity" appeared, and has since remained the standard list for his locality. Many reports of the Park Commissioners give lists of birds found in Forest Park and vicinity by Wm. W. Colburn and Robert O. Morris. One has a list by Mr. Morris alone.

For many years Mr. Morris was particularly active in the affairs of the Museum of Natural History in Springfield. Always alert for specimens not in its collection, many of the rare species in its cases are due to his forethought and liberality.

Mr. Morris was married in November 1872 to Miss Lizzie Cadwell, of Springfield. She died in 1918.

He was a man of polished manners, genial nature and exceptional personality. Certainly the world is better because he lived.—J. H. S.

ERNEST HAROLD BAYNES, an Associate of the Union for many years, died at his home in Meriden, New Hampshire, Jan. 21, 1925, in his 57th year. He was the son of John and Helen Augusta (Nowill) Baynes and was born at Calcutta, India, May 1, 1868. His education was received at the College of the City of New York, and after graduation he served

for a year or two as a reporter on the New York 'Times.' The years from 1893 to 1900 were spent as an assistant to his father, who was an inventor of photographic modeling. Subsequent to 1900 he devoted his energies to writing and lecturing on natural history topics, a field in which he was eminently successful. He had a wonderful faculty for interesting and holding the attention of his audiences, especially children and young people. He was associated with the Union from 1904 to 1906, from 1912 to 1916 and from 1918 to his death.

At his home at Meriden, close to the game preserve of the late Austin Corbin, Baynes became interested in the buffalo and conceived the idea of founding the American Bison Society. Upon the organization of this Society in 1905 he became the first secretary. He later organized the Meriden Bird Club and some 200 similar clubs in other parts of the country. Immediately after the World War he went abroad and collected data relative to the part taken by animals in the great struggle, and members of the Union who attended the Washington meeting in 1920 may remember his interesting lecture on this subject. He has lectured and written extensively on birds, chiefly from the standpoint of habits and bird protection and his principal work on this subject 'Wild Bird Guests' appeared in 1915. For several years he conducted an extensive lecturing campaign to combat antivivisection. A committee now proposes to raise a fund of $100,000 to his memory, the income to be devoted in part to the needs of his widow during her lifetime and the balance, together with the principal, after her death, will aid the work of the American Association for Medical Progress.

Baynes' contribution to wild life exposition and protection was essentially one of service and the future can assign more accurately than the present the place he made for himself by his enthusiasm, farsighted vision and power of conveying his message to his audiences.—T. S. P.

Mrs. Martha Evans Martin, a Life Associate of the American Ornithologists' Union elected at the last annual meeting in Pittsburgh, died of heart disease at her home near Watchung, N. J., Jan. 6, 1925. She was the daughter of Dr. John and Margaret (Briggs) Evans and was born at Terre Haute, Ind. Her education was received at De Pauw University, Greencastle, Ind., which in 1910 conferred on her the honorary degree of Master of Arts. Her husband Edwin Campbell Martin, at one time editor of 'McClure's Magazine,' died about ten years ago.

Mrs. Martin taught in the public schools of Richmond, Ind., for a year and was a court reporter for three years. She was a well known writer and contributor to current literature especially on astronomy and nature topics. From 1886 to 1891 she was associate editor with her husband of the 'Richmond Daily Telegram' and from 1896 to 1900 she edited 'Demorest's Magazine.' She was the author of several books including 'The Friendly Stars,' 1907, and 'The Ways of the Planets,' 1912. She was

interested in outdoor recreations of various kinds and especially in wild life. It is unfortunate that the members of the Union did not have more opportunity of becoming acquainted with her and with her work.—T. S. P

At the 23rd Congress of the Royal Australasian Ornithologists' Union held at Rockhampton, Queensland, in October, 1924, W. B. Alexander was elected editor of 'The Emu' to succeed Dr. J. A. Leach who was compelled by increasing official duties to relinquish the editorship which he has so ably filled during the last ten years. The report of the Check-List Committee was adopted and the second edition of the Check-List will probably be published this year. A full account of the proceedings appeared in the January number of 'The Emu' which was largely devoted to the meeting. The Congress in 1925 will be held in Victoria.

The annual meeting of the British Ornithologists' Union was held at the offices of the Zoological Society of London, Mar. 11, 1925, and was followed by a dinner of the B. O. U. and the British Ornithologists' Club at Pagani's Restaurant. Lord Rothschild, the President, presided at the meeting at which 43 members were present. W. L. Sclater was elected editor of 'The Ibis' for the next six years. The statement of membership of the Union showed a total of 502 including—454 Ordinary, 10 Honorary, 8 Honorary Lady, 10 Colonial and 20 Foreign Members. During the course of the meeting 27 candidates were elected to Ordinary membership.

The Third Annual meeting of the Baird Ornithological Club was held on March 27, 1925, at the residence of Mr. B. H. Swales. Officers for the ensuing year were elected as follows: President, Dr. Leonhard Stejneger; Vice-President, Dr. Alexander Wetmore; Secretary, Bradshaw H. Swales; Members of the Council, Drs. T. S. Palmer and Charles W. Richmond; Honorary President, Robert Ridgway.

At the meeting held February 25, 1925, Dr. C. Hart Merriam was elected an Honorary Member.—B. H. Swales, *Secretary.*

The thirty-fifth anniversary of the founding of the Delaware Valley Ornithology Club was commemorated by a dinner in Philadelphia on January 15, attended by 60 members of the Club and a number of visiting ornithologists including Dr. A. K. Fisher, Dr. C. W. Richmond, Dr. T. S. Palmer, Dr. Alexander Wetmore, B. H. Swales, Ludlow Griscom, C. A. Urner, B. S. Bowdish, P. B. Philipp and Chas. H. Rogers.

Mr. George H. Stuart, 3rd, president of the Club presided and Dr. Spencer Trotter acted as toastmaster.

The Federation of Bird Clubs of New England called an important meeting in Boston, Mass., on June 4, 1925, which was attended by many ornithologists, state officials and others in the interest of the preservation

of the Heath Hen. While 28 of these birds were found on Martha's Vineyard in 1923 and 48 in 1924 only eight have been seen this year and it is thought by those familiar with the habits of the birds that while some may have escaped observation there cannot possibly be more than 25 left.

As the species is found nowhere else its extermination is imminent and steps were taken by the meeting to secure additional wardens and to destroy the cats, hawks and other enemies of the Heath Hen.

The state authorities are in hearty accord with these efforts and have been doing all in their power to save the birds during recent years. It is to be hoped that the species may yet be saved from extermination.

The Federation has also recently purchased Ram Island in Buzzards Bay and offered it to the Commonwealth of Massachusetts to be kept as a reservation for birds, while a committee of the Federation has been appointed to ascertain all available spots where Gull and Tern reservations might be established on the New England coast.

At a recent Meeting of the 'Zoological Record' Committee of the Zoological Society of London it was unanimously agreed that it was highly desirable that the yearly volume should be completed and published within six or eight months of the close of the year to which it relates, and in order that this may be done the publications in periodicals reaching England after February 28 cannot be included but must be held back until the next volume.

At the present time there is a considerable delay in the receipt of the publications of Societies and Institutions, especially in those received from the United States which are chiefly transmitted in bulk through the Smithsonian Institution, or other agencies.

If Societies and Institutions would undertake to forward at once by book post the parts of their respective journals as soon as they are printed, either to the Editor of the Zoological Record direct (Care of the Zoological Society of London, Regent's Park, N. W. 8.) or to the Librarian of the British Museum (Natural History), Cromwell Road, London, S. W. 7., it would be possible to include a much greater proportion of the titles in the volume of the 'Record' to which they rightly belong.

An elaborate work on the Birds of Denmark including Greenland and Iceland is announced by E. Lehn Schioler to be completed in eight volumes in Danish, with plates many in color of the various species. The first volume is to appear in 1925 and will be sold at 250 Kroner. The publishers are Gyldendalske Boghandels Sortiment.

Mr. T. Walter Weiseman, of Pittsburgh, who has retired from business to devote his entire time to bird study, and photography will assist Mr. S Prentiss Baldwin in research work at Hillcrest Farm near Cleveland, Ohio, and will pay special attention to the habits of the House

Wren. Owing to Mr. Baldwin's illness no banding work was carried on at Thomasville this year but the station will be operated again next year.

MR. H. L. STODDARD, in charge of the Quail investigation, reports excellent progress and cooperation of owners of estates near Thomasville, gamekeepers, etc. He will welcome suggestions or correspondence relative to the work. His address is Beachton, Ga.

A MEETING of the International Committee for the Protection of Birds was held at Esch, Luxemburg, April 13 to 16, 1925. Dr. T. Gilbert Pearson, President of the Committee, was present and his report on the proceedings will appear in an early number of 'Bird Lore.' During the meeting a committee was appointed to consider the question of attempting to amend or extend the Treaty of Paris in order to provide more effective protection for non-game birds in Europe.

ANNOUNCEMENT was made by Dr. E. J. O. Hartert at the last annual meeting of the British Ornithologists' Union that it was proposed to hold an International Ornithological Congress at Copenhagen, Denmark, in May or June 1926. The Secretary of the Congress will probably be Dr. E. Lehn Schöler of Copenhagen, a Corresponding Fellow of the A. O. U. The details have not yet been announced but will be published later. Only five International Ornithological Congresses have thus far been held: (1) in Vienna in 1884; (2) in Budapest in 1891; (3) in Paris in 1900; (4) in London in 1905; and (5) in Berlin in 1910.

AT the next annual meeting of the A. O. U. the third award will be made under the Brewster Memorial Fund for the most meritorious work on American birds. This award of a medal and an honorarium is made biennially by the Council of the Union. Previous awards were made in 1921 to Robert Ridgway for Volume VIII of the 'Birds of North and Middle America,' and in 1923 to Arthur Cleveland Bent for his 'Life Histories of North American Birds.' Originally the medal was available only for authors whose works had been published during the two years preceding the award but at the last meeting of the Union the time limit was extended to six years. The field is now open to authors of any works on American birds which were published between July 1, 1919 and June 30, 1925.

MEMBERS of the Union or others who expect to present papers at the next meeting are requested to communicate with the Secretary as early as possible stating the title of the paper, whether or not it will be illustrated and the time required for its presentation. Owing to the length of the program it will be necessary to limit ordinary papers to 30 minutes or less and those with illustrations to not more than 45 minutes. All titles should be submitted before November 1.